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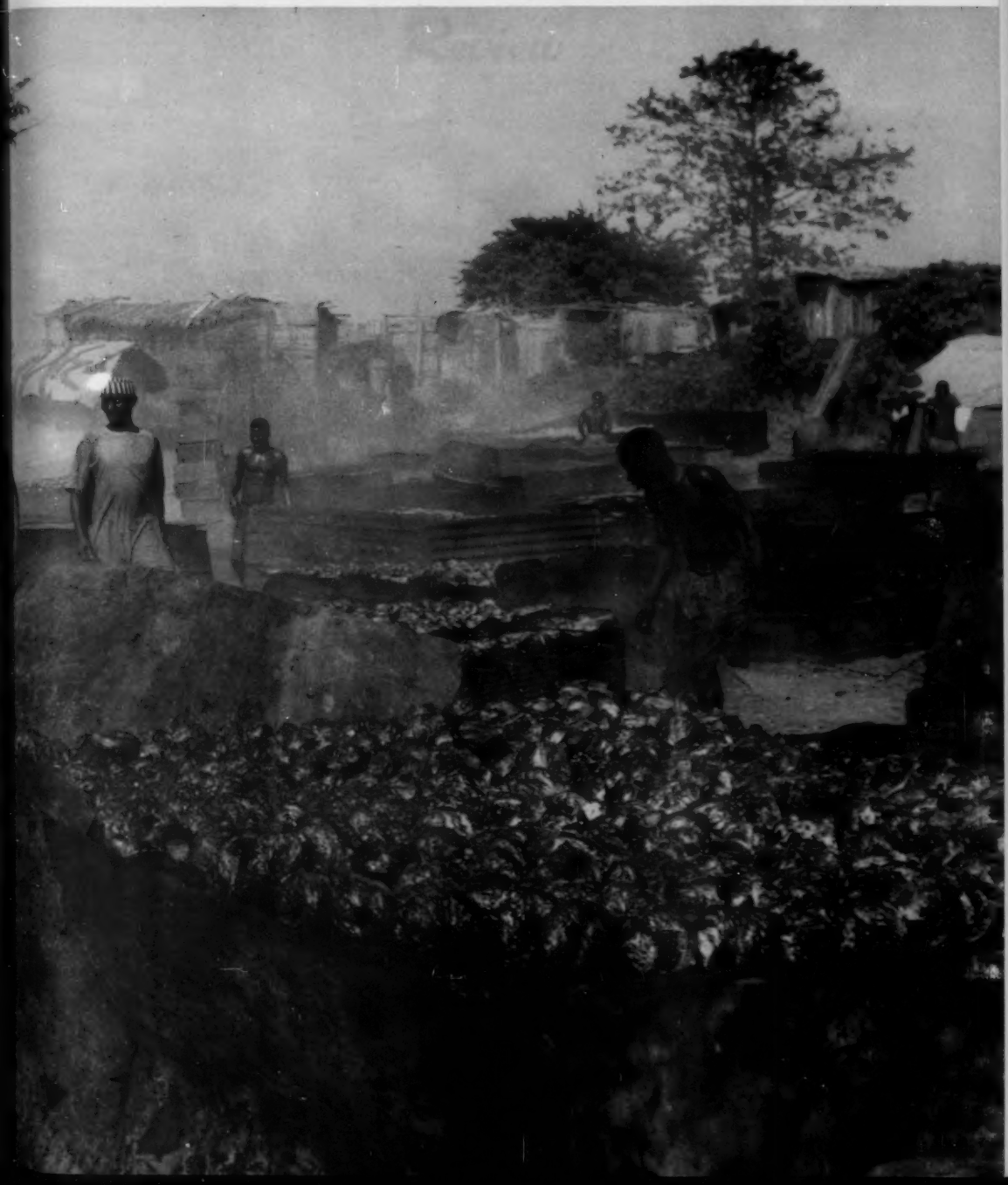
COMMERCIAL FISHERIES Review

VOL 31, NO. 5 MAY 1969



COVER: Smoking fish on the Ivory Coast. (FAO/A. Defever)

COMMERCIAL FISHERIES

Review

A comprehensive view of United States and foreign fishing industries--including catch, processing, marketing, research, and legislation--prepared by the Bureau of Commercial Fisheries.

Fishermen's Memorial
Gloucester, Mass.

Managing Editor: Edward Edelsberg

Production Manager and Associate Editor: Jean Zalevsky

Associate Editor: Barbara Lundy

Production: Alma Greene (Senior Compositor) and Mary Andrews

The Bureau of Commercial Fisheries and The Bureau of Sport Fisheries and Wildlife make up The Fish and Wildlife Service of The United States Department of the Interior.

Throughout this book, the initials BCF stand for the Bureau of Commercial Fisheries.

Address correspondence and requests to: Commercial Fisheries Review, 1801 North Moore Street, Room 200, Arlington, Va. 22209. Telephone: Area Code 703 - 557-4246.

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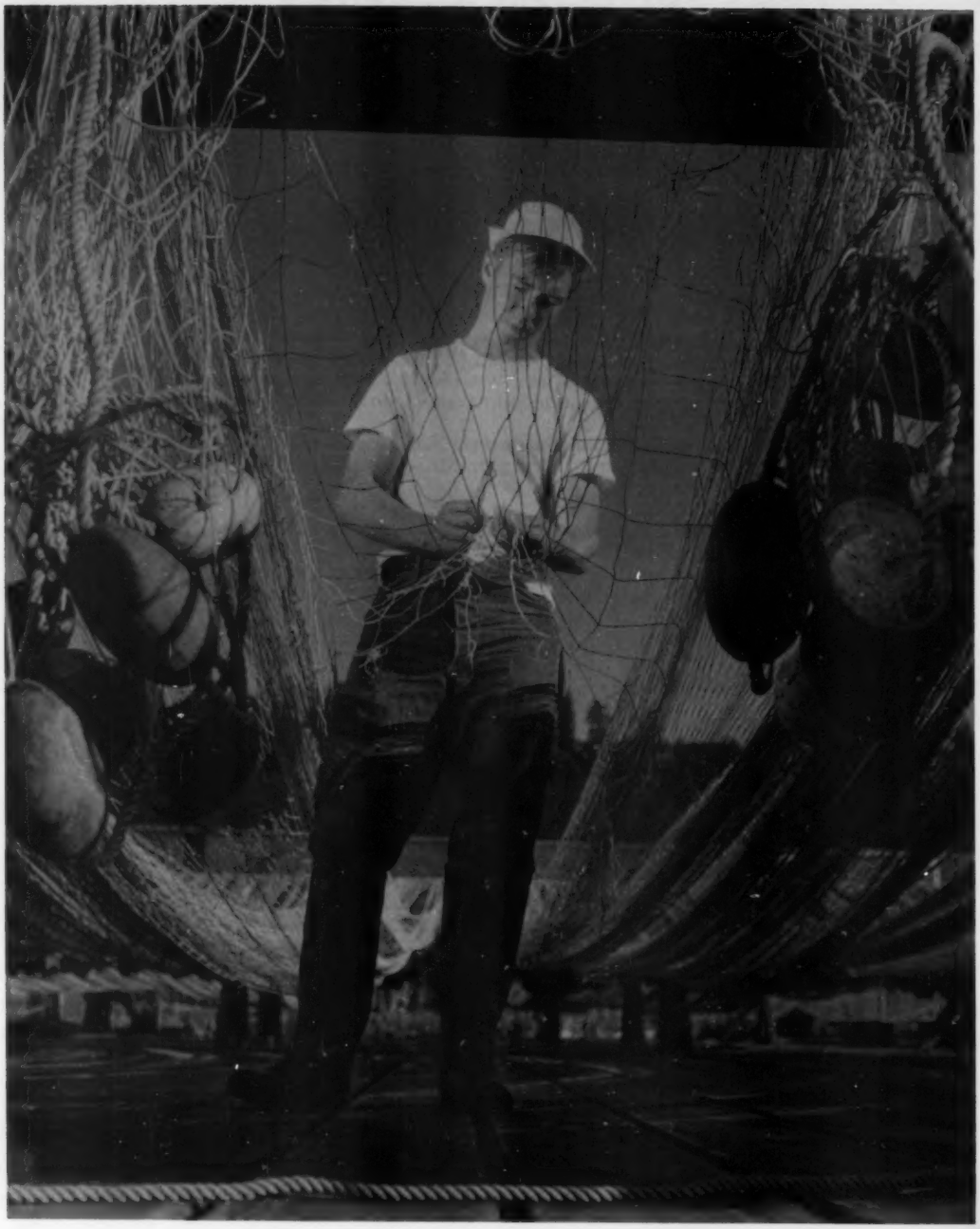

Learning the ropes--by mending rips in net. (State)

HICKEL URGES GREATER DEVELOPMENT OF OCEAN RESOURCES

As the world's population multiplies and moves closer to the oceans, the resources of the oceans become an important key to the future of mankind. The challenge of the sea "poses no insuperable scientific or technological barriers. . . . Our major need is for a recognition of the problem and a national commitment to meet it."

This is the major theme of the introduction by Secretary of the Interior Walter J. Hickel to a report urging adoption of that commitment. He asks the United States to develop the leadership necessary to meet the world's needs for the resources of the sea. The report is titled "Marine Resources Development. . .A National Opportunity."

Secretary Hickel writes that America's great agricultural wealth led to neglect of the sea's living resources and to greater dependence on imports--rather than to greater fishery harvests. He warns: "We must reverse this trend. At stake is not simply our ability to feed our own people. . . . The real stake is leadership in a protein-hungry world."

Department Qualified for Task

The Secretary believes his Department is the logical agency to play a leading role in the civilian part of such a new marine resources program. The Department "combines our Government's major capability for marine mineral exploration, recreation, and water quality and supply with its major capability for development, wise use and management of the living resources of the sea."

Of all civilian Federal agencies, Interior Department has the largest interest in the ocean. Its budget for ocean affairs is about 35 percent of total Federal civilian ocean activities. These programs deal with commercial and sport fisheries, oil and gas, minerals, water quality and supply, and recreation.

The Department has about 7,500 scientists and engineers working in resource research and development. Not all of them deal with marine resource problems, but their skills and experience can be brought to bear on these problems when needed. They are trained in all the disciplines required to manage and develop the sea's resources: biology, geology, pollution control, engineering, economics and other social sciences, law, and international affairs.

The Department has marine laboratories near all types of ocean environment. Most of these laboratories are associated closely with universities. The laboratories operate 21 large, seagoing, research ships and smaller vessels.

UNITED STATES

FDA Sets Interim Limit for DDT in Fish

Residues of the pesticide DDT and its derivatives in all fish shipped interstate will be limited to 5 parts per million (ppm). This was the interim guideline announced April 22 by the Food and Drug Administration (FDA).

FDA Commissioner Herbert L. Ley said this ruling is intended to protect the public from excessive levels of DDT in fish while a scientific review is completed. Also, it gives the fishing industry a specific standard. Fish carrying residues higher than 5 ppm will be subject to seizure.

Scientific Study

The National Academy of Sciences-National Research Council has been asked to nominate a panel of experts to review the importance of DDT residues in fish. The 5 ppm interim limit may be changed after that study. Residues of DDT in fish were not considered significant until recently because levels were generally low.

Less Than 1 PPM in 90% of Fish

Pesticide monitoring by FDA indicates that DDT residues are below 1 ppm in 90% of fish marketed in the U.S.

Tolerances for DDT residues in other foods vary. Examples: the tolerance is .05 ppm for milk, that for a wide variety of fruits and vegetables and the fat of meat 7 ppm. FDA has reduced some of these tolerances when experience showed lower levels were practicable.

New Hatchery Technique Produces Cultchless Seed Oysters

"Free" or "cultchless" spat (young or seed oysters) have been developed, report J. D. Andrews and L. W. Mason of the Virginia Institute of Marine Science (VIMS). This may lead to improved oyster culture in the U.S. and abroad. "Spat are separated from artificial substrates at a very early age and grown in trays and tanks without cultch until large enough to plant on beds."

The process was pioneered in 1967 by W. W. Budge and associates at Pacific Mariculture, Inc., Pigeon Point, Calif. Their success stimulated other hatcheries to develop their own method of obtaining "free" spat.

VIMS and the Windmill Point Oyster Co. have developed and are improving ways of producing "free" spat.

The Technique

After about 2 weeks of larval life, oysters attach themselves to a substrate, such as an oyster shell. At VIMS, larvae placed within fine plastic netting or screens are forced to set on threads of the net. They are easily washed off the threads with jets of water. Sand grains or fine particles of shell are also acceptable to the larvae. Young "free" spat are grown in containers about 2 weeks on cultured food or centrifuged river water. Then they are moved to trays in ponds or rivers.

Useful to Industry

VIMS states that commercial hatcheries financed by public and private funds have been struggling to compete in costs with wild spatfalls. A major expense has been washing and handling bulky shells used as cultch. "Now this step can be eliminated." Commercial shellfish hatcheries have been built in Canada, England, France, California, Connecticut, Massachusetts, New York, Oregon, and Virginia. Many are shifting rapidly to production of "free" spat. Methods change often as each lab and hatchery tries to meet its needs.

Benefits and Problems

Many potential benefits and problems are associated with "free" spat, VIMS believes. Some consequences are startling. Millions of spat from one pair of oysters of any species can be shipped anywhere cheaply and efficiently.

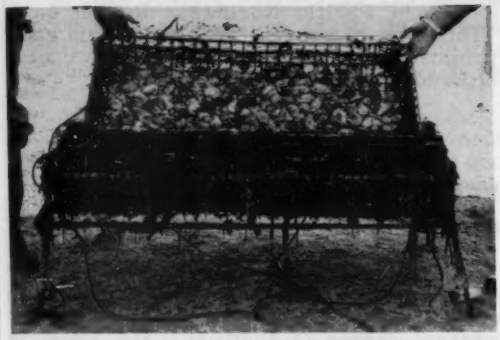

Fig. 1 - Experimental 18 x 40 inch plastic-coated tray with 5 square feet of bottom contains 265 cultchless oysters ($\frac{1}{5}$ bushel) without crowding. The larger legged tray contains more free spat and permits experimentation on natural oyster beds. Simpler open-mesh containers could be designed for suspension from floats, or set on stringers to hold 50 to 100 oysters per square foot through first year.

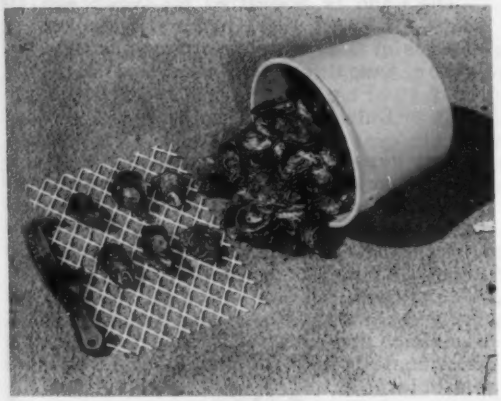

Fig. 2 - Free spat grow into single oysters at one year. The oysters grown in trays in York River from May through November (1968 year class) are ready to plant on natural bottom. The 5-quart bucket contained 120 relatively thick-shelled oysters weighing about one ounce each. Average length is about $2\frac{1}{2}$ inches, as shown by 3-inch culling iron and 1-inch plastic mesh for lining trays. The well-shaped oysters will be marketable in one more growing season. A count of 1,200 per Virginia bushel excels James River stock; in the latter, 1,000 mixed one to 4-year-old oysters is rated good-quality seed. (Photos: VIMS)

VIMS scientists believe this heightens the urgency of genetic studies of oysters, and the necessity to develop fast-growing, disease-resistant strains. Introduction of unwanted oyster species and their diseases may become critical and difficult to control.

The French oysterman, who now offers European, Portuguese, and Japanese oysters, may decide to offer also Chilean and Australian oysters, for example. The Frenchman now pays one-tenth to one cent apiece for seed oysters; this depends on a wild set that fluctuates annually. W. W. Budge hopes to sell his spat for a penny apiece, or less, depending on quantity.

Nursery Techniques

Nursery techniques or methods of growing "free" spat to sizes resistant to predators (crabs, fish, drills, starfish) are a serious problem for hatchery seed. Oyster spat, unlike clams, are not able to reattach or dig into substratum, so they are easily washed away or covered by silt. "The challenge now is to grow 'free' spat in trays or ponds to a size suitable for planting on oyster beds."

The hobbyist who wishes to grow oysters in trays suspended from floats or front-yard pier may benefit from "free" spat sooner than Virginia's commercial oysterman. Half-grown wild seed oysters can be bought at about 10 for a penny. The hobbyist who buys a million "free" spat, $\frac{1}{4}$ to $\frac{1}{3}$ inch--with a volume of perhaps one quart--should be prepared for rapid expansion of his tray space. Without losses, which are inevitable, one-inch oysters grown to $3\frac{1}{2}$ inches will increase in volume 25 times.

In Virginia, "free" spat should be obtained in May to take full advantage of spring and summer growth during the first year. Average conditions should permit marketing or eating tray-grown oysters in 2 years.

"Chesapeake Bay has a relatively large supply of wild oysters for harvesting and transplanting," VIMS states. So hatcheries and "free" spat are probably not competitive here but may be in Long Island, N.Y. Interest is high in Virginia.

Below-Average Hawaiian Skipjack Season Forecast

Hawaii's largest fishery--that for skipjack tuna--may turn out to have another discouraging season. This is predicted by scientists of BCF's Biological Laboratory at Honolulu.

They forecast a 1969 catch smaller than the long-term average of 10 million pounds. The lowest catch of recent record was 6 million pounds in 1957; the highest was 16 million pounds in 1965. If the scientists are correct, it will be the fourth consecutive catch below long-term average.

Water Warms Late

Their forecast is based on the time when the waters off Oahu begin to warm. Warm water of low-salinity is associated with good skipjack tuna seasons. This year, the warming has begun late--"an ominous sign for the fishery."

New Shoals Located During EASTROPAC Cruises

Continuous traces of the ocean bottom made by BCF's 'David Starr Jordan' during EASTROPAC cruises have revealed shoals in the eastern Pacific not previously recorded on navigation and oceanographic charts. These are:

Depth (Fathoms)	Position
870	10°34' N., 111°21' W.
1,285	10°17' N., 111°20.8' W.
820	9°20.5' N., 111°20' W.
1,445	16°05' N., 107°24' W.
1,100	6°05' N., 104°47' W.
230	13°16.5' N., 118°53.0' W.

BCF La Jolla believes: "This information should be of considerable interest to fishermen since tuna tend to congregate at such shoals, although some of these spots are probably deeper than those which aggregate fish."

Underutilized Species Have New Market Potential As Feed

The potential U.S. demand for improved feed made from fish for marine mammals in zoos and aquaria has been estimated by BCF's Technology Laboratory in Seattle, Wash., at 20,000,000 pounds; the foreign market at 10-20,000,000 pounds. The lab is developing such feed. There is also a potential market in feeding pets and ranch fur animals.

BCF's Pacific Northwest Region says: "This type of product appears to hold great promise as a market outlet for such underutilized species as hake and herring."

BCF's Seasonal Alewife Survey Is Underway

BCF's research vessels 'Kaho' and 'Cisco' are conducting a coordinated fishery resource assessment survey along the eastern and western shores of southern Lake Michigan from April 29 to May 15, 1969. This survey is made each spring and fall to obtain life history and population dynamics information on alewife and other important fish stocks, such as chubs, salmonids, and yellow perch.

The Kaho is operating off Waukegan, Illinois, and Port Washington and Manitowoc, Wisconsin. The Cisco is operating off Benton Harbor, Saugatuck, and Ludington, Michigan.

Kinds of Data

Both vessels are fishing the standard biological assessment net, a 39-foot North Atlantic whiting trawl with $\frac{1}{2}$-inch mesh (stretched measure) cod end. The data collected include numbers of each species, total species and individual weights, scale samples for age determinations, sex ratios for all species, and stomach content information for salmonids. Abundance and availability information about commercially important species will be made available.

Lake Oahe Commercial Catch Increases

In recent years, commercial catches from Lake Oahe (South Dakota) have increased steadily in weight and value:

Year	Quantity	Value
	Lbs.	$
1966	297,400	31,005
1967	548,300	58,064
1968	754,000	80,000

In 1968, buffalo, carpsucker, and goldeye accounted for 90% of the catch. BCF-developed floating hoop nets landed 19% of the total catch and 28% of the buffalo catch, though few were used.

Some 1,200 lifts were made with the modified hoop nets, 4,000 lifts with standard hoop nets. The BCF-modified hoop nets were about 1.8 times more effective. They took an average of 117 pounds per lift compared to 65 pounds for standard hoop nets.

This small-value commercial fishery contributes welcome income in a region of sparse population and limited income opportunities.

Import Quota Set for Tuna Canned in Brine

The quantity of tuna canned in brine that may be imported into the U.S. during 1969 at the 10% rate of duty is limited to 71,703,494 pounds. This is equivalent to about 3,414,452 cases of 48 7-oz. cans. Any imports above the 1969 quota will be dutiable at the rate of 20% ad valorem. The 1969 quota is 7% greater than in 1968, and 3.2% above 1967.

The 1969 quota was reported by the U.S. Bureau of Customs. It is based on the U.S. pack of canned tuna during the previous year (1968) reported by the U.S. Fish and Wildlife Service.

U.S. Agency Loaned $10 Million to Fishing Industry in FY 1968

Between July 1, 1967, and June 30, 1968, the Small Business Administration approved 342 loans to the fishing industry (including fish processing and distribution) totaling nearly $10 million.

The 2 largest loan categories were $6,244,729 of "business loans," which went mostly to feed manufacturers, and $2,134,049 in disaster loans, mostly to shellfish fishermen.

Fishermen and Hunters Spent Record $168 Million in Fiscal 1968

Fishermen and hunters spent a record $168 million for licenses, tags, permits, and stamps during fiscal year (FY) 1968, Interior Department's Bureau of Sport Fisheries and Wildlife (BSFW) has announced. It was nearly $14 million more than the previous high in FY 1967.

Fishing-license holders increased 930,670 to a new high of 23,060,332. Hunting-license holders numbered 14,931,270, up 245,538 over a year earlier.

BSFW pointed out that license sales are not accurate measure of the numbers of hunters and fishermen. In some States, sportsmen must buy separate licenses, stamps, permits, or tags to catch different kinds of fish or game. Also, most States do not require persons above or below certain ages to buy licenses; and most coastal States do not require licenses for saltwater fishing. Many persons hunt and fish in more than one State and so are counted more than once.

The figures do show that hunting and fishing are increasing sources of recreation.

Major Revenue for States

License fees are a major source of income for States in carrying out their fish and game programs. State fish and game departments certify the number of paid hunting and sport fishing license holders to BSFW for use in distributing Federal Aid in Fish and Wildlife Restoration funds to the 50 States.

Water Standards of All 50 States Now Approved

On April 29, Interior Secretary Hickel approved the water quality standards of Kansas, the 50th state to join in a National effort to enhance and protect the quality of water resources.

Secretary Hickel said: "This puts us over the first big hurdle toward better water in this country. We now have a working basis for upgrading and protecting the water resources in all 50 states and the other

jurisdictions involved. Some of the standards still need improvement, and there is a big job ahead in meeting all of them. But we are on our way."

Standards also have been approved wholly or partly for Washington, D. C., Delaware River Basin, Puerto Rico, Virgin Islands, and Guam.

The standards of 24 states have been fully approved; the standards of other states were approved with some exceptions that remain to be worked out.

Some State Levels Higher

Non-degradation provisions in the standards--designed to maintain water quality where it is now higher than the limits set by the standards--have been approved for 19 states, Puerto Rico, Guam, and Washington, D. C.

The standards program was authorized by the Water Quality Act of 1965. It covers all interstate and coastal waters. The standards are subject to both State and Federal enforcement.

In addition to interstate standards, some States also have set similar standards for intrastate waters.

Coast Guard Says Boat Capsizings Claim Most Lives

Boating accident statistics compiled by the U.S. Coast Guard (CG) show that more lives have been lost because of boat capsizings than any other single cause. According to the Chief of CG's Office of Boating Safety, many of these fatalities could have been avoided had the victim known the right thing to do.

What To Do

CG states that a boat's occupants often are not injured when thrown into the water. Most drownings that follow capsizings result from improper actions by the victims.

CG offers a few rules to save lives: (1) Use CG-approved lifesaving devices; (2) Stay with the boat; (3) Keep calm. "By staying with the boat, a person thrown into the water increases his chances of being spotted by rescuers. Statistics show that in most cases swimming ashore is the wrong thing to do."

By regulation, CG-approved devices, one for each person, must be carried on every motorboat. "When not being worn, they must be readily available. Crewmen and passengers should know how to use them."

Coast Guard Recommends Marine Radio Distress Procedure

The U.S. Coast Guard emphasizes that proper marine radio procedure is vitally important to the vessel in distress. A distress situation often produces confusion. Existing procedures for communications by marine radio can be helpful. The best thing a crew can do is to keep calm and follow the procedures.

International Distress Procedures

The International Radio Regulations, updated by the International Telecommunication Convention (Geneva, 1959), designate the proper format for distress calls. The format is simple: The word "MAYDAY" 3 times on a distress channel, 2182 kilohertz or 156.8 megahertz; followed by "THIS IS"; the NAME of your vessel, 2 times. This should be followed by vessel's POSITION, a DESCRIPTION of vessel, and TYPE OF ASSISTANCE required. Also include any other IMPORTANT INFORMATION. Repeat call often, until answered. If no one replies, continue the call for help.

The Coast Guard states that all crewmen should be familiar with the procedures of making a distress call. Everyone should be briefed about the radio and its proper use in an emergency.

Marine Technology Society Conference Slated for Florida June 16-18

The Marine Technology Society will hold its fifth annual conference at the Fontainebleau Hotel in Miami Beach, Fla., June 16-18. Theme: "The Decade Ahead: 1970-80."

The planners expect 2,500 people to attend--ocean engineers, marine systems managers, scientists, and oceanographers. Speakers will include Vice-President Spiro Agnew.

Conference cosponsors are the Florida Commission on Marine Sciences and Technology, the University of Miami, and the International Oceanographic Foundation.

Green Dye Treats White Spot Disease in Catfish

Auburn University is using a green dye to cure the fatal white spot disease in catfish. The dye, Victoria Green S Extra Concentrate, is made by the GAF Corporation, a New York-based chemical producer, which reported the dye's use on catfish.

White spot is caused by a one-cell protozoan that attaches itself to the catfish--and literally gets under its skin. White spot disease has been known to destroy an entire fish crop within a few months. Dr. Ray Allison, a fish-disease expert at Auburn, says he has not figured out how the dye does the job, but that it does.

"Isk"

GAF reports a survey of Alabama catfish farmers indicates many farmers are using the green dye to combat "Isk" (short for Ichthyophthirius) as the parasites are commonly called. The dye has a germicidal effect on the parasite; it destroys the life cycle.

The catfish farming season runs 10 months. Fingerlings stocked in ponds in February reach marketable size of about one pound each by late fall. ('Oil, Paint and Drug Reporter,' April 28.)

BCF'S WOODS HOLE LAB PARTICIPATES IN PROGRAM FOR BLIND CHILDREN

The Connecticut Valley Shell Club in Springfield, Massachusetts, has undertaken the very worthy project of helping blind children become acquainted with sea shells. Shells donated by club members, organizations, and interested individuals are assembled by the members and evaluated for possible use by students at the Perkins School for the Blind in Watertown, and the Walter E. Fernald State School in Waverly. Then the shells are examined by a rehabilitation counselor of the State Commission for the Blind for usefulness and "interest by sense of touch". The selected specimens are incorporated into one or 2 collections.

One collection (teaching collection) consists of 50 specimens, each of several different kinds. Each child examines by touch the same species of shell while the instructor describes it and relates its biological habits, uses, etc. The other collection consists of a display series which contains only one specimen of many different kinds of shells. These are assembled and kept in special styrofoam cases. Each shell is numbered in braille to correspond with the numbered master list, also in braille, which gives the name of each shell.

Personnel at the BCF Biological Laboratory at Woods Hole, Mass., are proud to have supported this project in a small way by collecting mollusk shells from the New England fishing banks.

Fishery Legislation Proposed in Congress

House Votes to Extend Marine Resources and Engineering Development Council

On April 21, the House of Representatives passed H.R. 8794. This would change the expiration date of the National Council on Marine Resources and Engineering Development from June 30, 1969, to June 30, 1970. The bill also reduced the annual appropriation from $1,500,000 to $1,200,000. On April 22, the House-passed bill was referred to the Senate Committee on Commerce.

Senate Action

On the same day, Sen. Magnuson, Wash., introduced for himself and others a Senate bill to continue the Council (S. 1925). He feels the Council must continue its work without interruption until at least June 30, 1970. He noted that the Council has appointed 5 committees to undertake studies in marine science and technology and to submit recommendations.

The Committees are: the Committee on Multiple Use of the Coastal Zone, on which the Council is placing greatly increased emphasis, headed by the Assistant Secretary of the Interior for Fish & Wildlife and Marine Resources, and committees on Marine Research, Education and Facilities; Ocean Exploration and Environmental Sciences; Food From the Sea; and International Policy in the Marine Environment.

Council Publications

Sen. Magnuson also pointed out that the Council solicited the views of non-Federal organizations and individuals with capabilities in marine science. It then awarded 24 contracts to various industries, research organizations, and institutes for technical and highly specialized studies. Fifteen have been completed and are available, for a nominal charge, from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151. Two more, 'Gulf of Mexico Research and Environmental Programs,' and 'Legal Aspects of Great Lakes Resources,' should be available soon. 'Multiple Use of Lakes Erie and Superior' is nearing completion.

Passage of Water Pollution Control Amendments Nearly Unanimous

By a record vote of 392 yeas to 1 nay, the House passed H.R. 4148 amending the Federal Water Pollution Control Act, and agreed to amendments that:

1) direct the Secretary of the Interior to make a study of any and all methods of financing the cost of preventing, controlling, and abating water pollution;

2) provide for the presentation of awards to private industry and local governments for excellence in their water pollution programs; and

3) provide for a Great Lakes water control demonstration.

The House rejected amendments that sought to:

1) place controls on the effect of thermal pollution by nuclear reactors;

2) provide for the establishment of a national pollution disaster area;

3) delete the sections regarding training grants and contracts and scholarships from the bill;

4) prohibit the States from enforcing anti-pollution regulations against any vessel subject to provisions of the act; and

5) bar the dumping of dredgings into the Great Lakes by the Army Corps of Engineers.

Fishing Fleet Expansion

Sen. Magnuson also introduced a bill to provide a new maritime program (S. 1915, Apr. 22). Studies and negotiations with administration and industry officials were held on a similar bill in the 90th Congress (S. 2650). Sen. Magnuson said the new bill will broaden eligibility for construction subsidies. It also will provide an extension of the tax-deferred capital reserve fund program to all U.S.-flag operators in the foreign and domestic trades, and to fishing vessel operators. At present, the program is in effect for the subsidized operators.

Reimbursements to Commercial Fishermen

On April 18, Sen. Hart, Mich., introduced S. 1889. This bill would provide partial reimbursement for losses incurred by commercial fishermen as a result of State-imposed restrictions on commercial fishing.

--Barbara Lundy

OCEANOGRAPHY

Map Seabed Off Northern California

An imposing undersea ridge and canyons more than a mile deep are depicted on a new bathymetric map of the seabed off Northern California published by ESSA's Coast and Geodetic Survey (CGS). The map covers about 13,000 square statute miles of sea bottom and extends from 87 to 107 miles seaward off California from the Oregon border to Point Delgada. It is the most detailed bottom topography of the area ever published. The map is one of a series planned by CGS for the seabeds off the Atlantic, Pacific, Alaskan, and Gulf coasts.

Ridge & Canyons

The major undersea features shown include part of the Mendocino Ridge and the Mattole, Trinity, and Eel Canyons. About 85 miles of the ridge, one of the most outstanding underwater features off the coast, are seen. The ridge's steep north side rises sharply 7,000 feet from ocean floor 25 nautical miles off Punta Gorda and extends due west 2,000 miles. The ridge's sloping south side drops over 8,300 feet at a point southwest of the Gorda Escarpment.

The Mattole Canyon starts at a depth of 32 feet about a $\frac{1}{4}$ mile from shore and drops to 6,500 feet within 20 miles. The Eel Canyon begins at 250 feet 6 miles from shore and falls to 8,200 feet within 20 miles. The Trinity Canyon begins at 3,900 feet 22 miles from shore and drops to 9,800 feet within 22 miles.

Imposing undersea ridge and canyons more than a mile deep are depicted on new bathymetric map of seabed off northern California published by ESSA's Coast and Geodetic Survey.

CGS Maps

The bathymetric maps are designed to aid Federal, state, and industrial interests in exploring and developing the potential resources of the Continental Shelf.

Foreign Fishing Off U.S. in March 1969

NORTHWEST ATLANTIC

Good weather in March permitted excellent coverage of foreign fishing from south of Nova Scotia to Cape Hatteras. A total of 218 Soviet, Polish, Spanish, Japanese, Norwegian and East German fishing and support vessels were sighted. This was 17% more than the 182 sighted in Feb. 1969.

Soviet vessels--125 early in the month and about 175 by the end--included 20 factory stern trawlers, 135 medium side trawlers, 6 factory base ships, 6 refrigerated transports and cargo ships, 1 tug, and 1 tanker. (In March 1968, about 125 had been sighted off southern New England, New York, and New Jersey.)

During first week, 70 medium side trawlers and 10 support vessels were dispersed north and south in a 30-mile area, 20 to 40 miles east of Oregon Inlet, N.C., to 20 miles east of Cape Hatteras. Moderate catches in open deck storage areas appeared to be sea herring.

By midmonth, 95 medium side trawlers and 5 factory base ships were in a 15-mile area, 17 to 20 miles east of Oregon Inlet. Huge catches of herring, which filled open deck areas on most trawlers, also were heaped in open storage areas on several huge factory base ships.

By the third week, fleet had increased to estimated 165 vessels--143 medium side trawlers, 10 support ships, and 12 factory stern trawlers. Some 148 were in a 35-mile area, 35 to 50 miles east of Currituck Sound, N.C. Huge catches of herring on the side trawlers were being placed directly into barrels. Some catches were so excessive, covering all deck areas, that fish were unloaded directly from the trawler. A large bucket was used to hoist the fish aboard the base ship. The base ships and transports also held huge amounts of fish in open storage areas.

Factoryship 'V. Putintsev' nested with refrigerated transport 'Visili Perov'; 'SRTM 8-407' alongside. These vessels are on shrimp grounds in Portlock Banks. (Photo: Branson)

OFF SOUTHERN NEW ENGLAND

Soviet: Early in March, 15-20 stern trawlers fished along the 50- and 100-fathom curve, from south of Nantucket to south of Block Is., R.I., just beyond eastern boundary of 'no fishing' zone, in ICNAF subarea 5. Catches, primarily red hake, included some herring. By third week, about 10 had shifted to areas off North Carolina and Virginia. The others remained south of Nantucket.

OFF MIDATLANTIC

Soviet: The largest fleet concentration was off North Carolina and Virginia; only a few scattered vessels fished off New Jersey.

About 10 factory stern trawlers (previously fishing red hake off southern New England in subarea 5) fished in deeper water a few miles east of the main concentration. Moderate-to-heavy catches were observed on board. Several hauls were estimated at 25,000-35,000 pounds.

A group of 17 vessels caught moderate amounts of herring 50 to 55 miles east of Chesapeake Bay.

Late in March, an estimated 100 Soviet vessels--mostly side trawlers, with 11 base ships and support vessels--were located about 60 miles east of Chesapeake Bay entrance.

Polish: Early in March, 5-6 large side trawlers and 1 factory base ship were 30-35 miles east and southeast of Cape May, N.J. Small catches of herring were observed. By third week, they had shifted south to join a small group of Soviet vessels 50-55 miles east of Chesapeake Bay. Large catches of herring were observed.

Late in month, 22 large side trawlers and 1 factory base ship (with good catches of herring) were sighted in a 15-mile area, 60 miles southeast of Cape May.

Japanese: 5 stern trawlers were sighted. On March 18, 2 were 60 miles south of Montauk Point, L.I. On March 24, all 5 were about 70 miles south of Nantucket. No catches were noted.

Spanish: On March 18, 10 pair trawlers--4 stern and 6 side trawlers--worked along northeast peak of Georges Bank. No catches were observed, although this is a productive cod area. Several U.S. fishing captains reported 40 vessels (stern and side trawlers) working southeast part of Georges Bank from mid-February to early March. (About 30 Spanish vessels had been reported on eastern slopes of Georges Bank in March 1968.) This number had decreased to 6 or 8 by mid-March.

East German: Early in March, a single freezer stern trawler was sighted in the large Soviet fleet off North Carolina.

Norwegian: On March 18, the long liner 'Koralhav' was sighted on winter fishing grounds of Georges Bank. No catches were noted.

U.S.-USSR MIDATLANTIC FISHERIES AGREEMENT

No Soviet vessels were observed in the 'no fishing' zone. Three to 5 vessels often conducted support activities in the Long Island loading zone.

GULF OF MEXICO & SOUTH ATLANTIC

No foreign vessels were reported fishing in March 1969.

OFF CALIFORNIA

Soviet: One stern trawler was sighted not fishing about 25 miles off Eureka on March 5. On March 19, the same trawler, 3 other stern trawlers, and one side trawler fished 15-18 miles west of San Francisco Bay. No catches were observed.

The research vessel 'Professor Deryugin' was in Los Angeles harbor, March 21-26, to take on fuel, water, and food. She also picked up U.S. gear for hake population survey she is conducting with BCF and Scripps Institution of Oceanography. She will be off California and Baja California for about 6 weeks.

OFF PACIFIC NORTHWEST

Soviet: Two fishing vessels were sighted in March--Professor Deryugin on way to Los Angeles and a stern trawler fishing off Oregon. No catches were observed. (16 vessels were sighted in March 1968.)

Japanese: Two long liners were sighted 3 times. During first week, quantities of what appeared to be ocean perch were observed on one vessel. (In March 1968, there were 2 stern trawlers and 1 long liner.)

OFF ALASKA

Soviet: Between 160 and 165 fishing and support vessels were sighted in March, about the same number as in February. Effort in the central Bering Sea herring fishery declined as the eastern Bering Sea king crab fishing and Gulf of Alaska shrimping began. (In March 1968, about 100 Soviet vessels fished off Alaska.) The 60% increase in March 1969 was due to expanded effort in both central Bering Sea herring fishery and eastern Bering Sea flounder fishery.

In previous years, the eastern Bering Sea flounder fishery had declined in March. This year, about 70 vessels--25 factory trawlers, 30 medium trawlers, 13 factoryships and refrigerated transports, and 2 other support vessels--worked throughout month. Besides flounder, small quantities of Alaska pollock

were seen in catches of some trawlers. The fishery's longer-than-normal duration at such a high level may be due to the fact that fishing for pollock began as flounder catches declined. Pollock are used mostly for fish meal.

Herring catches in central Bering Sea may not be falling off as sharply as in the past. The number of vessels did not decline as rapidly as in previous years. At month's end, there were about 23 stern trawlers, 25 medium trawlers, 12 factoryships, refrigerated transports and other support vessels. Formerly, only a few vessels still remained at the end of March.

The 18 medium trawlers fishing bottomfish--primarily arrowtooth flounder and sablefish, and possibly Alaska pollock--off Continental Shelf edge in eastern Bering, decreased to 12 during month. Most of departing vessels moved into Gulf of Alaska to fish shrimp.

In mid-March, 1 factoryship and 3 tangle-net setting trawlers started eastern Bering Sea king crab fishery on the Continental Shelf edge north of Alaska Peninsula. By late March, a second factoryship, 3 more net-setting trawlers, and probably 2 exploratory vessels had joined them. This fishery was conducted at the 1968 level.

Two factoryships and 10 medium trawlers had begun fishing shrimp on Portlock Bank, east of Kodiak Is., in Gulf of Alaska, by end of March (about 2 weeks later than in 1968).

Japanese: Vessels increased from about 30 at end of February to about 125 by mid-March. The increase was due to arrivals in eastern Bering Sea minced fish meat and meal fishery--and to start of annual eastern Bering Sea crab fishery.

The ocean perch fishery continued at extremely low level. Gulf of Alaska fishing was over by month's end, but about 4 stern trawlers were still fishing in eastern Bering Sea.

In early March, eastern Bering Sea trawl fishery for flatfish and Alaska pollock increased from 1 factoryship and 6 trawlers to 3 factoryships, about 76 trawlers, and 2 reefers. This fishery centers on and along Continental Shelf edge just north of Unimak Pass.

Twelve trawlers, supported by at least 1 factoryship serving as a refrigerated transport, continued herring fishery in central Bering Sea northwest of Pribilofs (close to Soviet herring fishery).

The annual crab fishery on Continental Shelf, north of Alaska Peninsula in eastern Bering Sea, began in 2nd week of March with 2 factoryship fleets. One fleet used only pots (pots are very selective for tanner crab); the other, primarily fishing pots, also used tangle-net gear. The 2 factoryships are licensed to be accompanied by 30 trawlers or schooners, which serve as pot tenders and tangle-net setters. The catch of one fleet, observed during a boarding, was about 90% tanner crab and 10% king crab.

Long liners fishing sablefish in Gulf of Alaska, off southeast Alaska coast, increased from 2 to 4 during the month.

STATES

Alaska

1969 HERRING PROSPECTS

Prospects for the Southeastern Alaska herring-egg-on-kelp fishery are poor, reports BCF Juneau. This fishery is centered at Craig, Hydaburg, and Sitka. In 1966, it produced 660,000 pounds worth $496,000 in a fishing season of only a few hours.

Herring spawning in the Craig area is down with only 6 lineal miles of spawn--compared to an average of 12 miles; deposition on the commercially desirable kelp is limited.

Although spawning occurs slightly later in the Hydaburg and Sitka areas, the situation appears the same.

But catches of herring for sac-roe are likely to increase in Alaska's south-central area. The 1968 Kodiak herring catch was 2,524 tons. A similar fishery will be conducted in 1969. Also, negotiations have been completed for Prince William Sound herring to be delivered to Korea in dry-salted form. Korean facilities will extract the roe, and the carcasses will be prepared for markets in other ways.

Experiments This Year

There will be considerable experimentation this year with methods of inducing herring to spawn on artificial surfaces--which are to be recovered later as a form of spawn-on-kelp and salt cured for a Japanese market.

In the Kodiak area, a plastic ribbon will be tried as a substitute for kelp. Also, kelp shipped in from California will be placed in spawning locations. In Prince William Sound, a similar experiment will be tried using dried kelp brought from Japan.

* * *

LIFT BAN ON AIRSHIPPING LIVE CRABS

The 1969 Alaska State Legislature lifted the ban on airshipping live crabs.

Back in 1964 the legislature passed a regulation making it unlawful to ship live crab from Alaska. It was feared then that large vessels with live tanks would transport crab to Seattle, Wash., for processing. This would eliminate jobs for Alaskans. Primary processing of crabs became mandatory within Alaska.

BCF's Alaska Region believes "the reasoning is still valid. However, the air shipment of live crabs is an entirely different concept. The crabs would be landed in Alaska ports by Alaska licensed fishermen, prepared for shipment by Alaska labor, sold and shipped by Alaska dealers and carried by airlines serving Alaska. Over the last several years improvement in aircraft serving Alaska and technological developments in packaging and handling live crabs has opened the way for a large and lucrative market for prime Alaska Dungeness crabs."

California

"FISH-LIFT" PLANNED TO INCREASE SALMON RUNS

The California Department of Fish and Game (DFG) has launched a very large "fish-lift" to help young salmon down the Sacramento River and to bolster future runs of king salmon. DFG Director Ray Arnett said in April that about 15 million fish--weighing 167,000 pounds--will be hauled from state and Federal hatcheries in special fish-planting trucks and released in the Sacramento-San Joaquin Delta near Rio Vista over the next 5 months.

The program started April 1. It will continue through mid-September 1969 as part of DFG's stepped-up management program to rehabilitate the Central Valley's king salmon resources.

Salmon Runs Drop

Salmon runs have declined in recent years. This caused serious concern for the future of this vital resource, which contributes greatly to sport and commercial salmon catches on the Pacific Coast. This year there was a slight increase in spawning runs.

George Warner, Chief of DFG's Anadromous Fisheries Branch, said: "Tests over the past few years have shown that Sacramento River salmon fingerlings trucked downstream to the Delta for planting return in larger numbers than those planted at the hatchery. Accordingly we are going to move fish downstream from Nimbus and Feather River hatcheries, and the U.S. Bureau of Sport Fisheries and Wildlife also has agreed to plant 50 percent of the fingerlings from Coleman National Fish Hatchery downstream."

Warner noted that the downstream migration is a critical period for juvenile salmon. The downstream release will increase their survival and later contribution to salmon catches. Greater returns of adult salmon to the spawning grounds also are expected.

Apparently because of the time they spend in homestream waters at hatchery rearing ponds, the salmon trucked to release sites show just as strong a "homing instinct" when they return from the sea as those released at the hatchery.

Warner added: "We believe this program of raising salmon to the 90-to-the-pound size and trucking them downstream will do much to restore our salmon runs."

June 1 Biggest Day

The biggest single day of the operation will be June 1, 1969. Then, 15,000 pounds of fish from Coleman Hatchery will be trucked to Rio Vista for release.

Of the total 15 million fish, about 9 million will be from the Federal Coleman Hatchery, and 6 million from the state-operated hatcheries at Oroville and Nimbus.

Other phases of the accelerated management program include quickened "program of screening irrigation diversions to prevent loss of downstream migrants; fish salvage operations at the state and Federal pumping facilities in the Delta; coordinated hatchery management; and agreements with water-development agencies to improve flows during critical migration periods on the San Joaquin River."

* * *

STURGEON YIELDS TAG ATER 13 YEARS

A sturgeon tagged in San Pablo Bay by California's Department of Fish and Game (DFG) was caught by a Sacramento angler 13 years and 115 days later. It was a record for tagged sturgeon in California. The angler promptly returned the tag to DFG and asked for information about the sturgeon.

DFG told him that tag Number B5812 was affixed to a 62-inch sturgeon on Nov. 17, 1954. Its biologists said they would have to examine the fish closely to be sure of its exact age. However, they guessed it was 29 to 32 years old when caught on March 12, 1969, about one mile south of the Richmond-San Rafael Bridge. It was 77 inches long and weighed 102 pounds.

Oregon

FISH COUNTING IS NOW TELEVISED

The television screen at Willamette Falls Fishway in Oregon City, Oregon, is full of fish, reports BCF's Northwest Region. A new process is being used to count adult salmon returning from the Pacific Ocean through the Columbia on their way to Willamette River spawning grounds.

Counting fish to inventory and identify annual runs of salmon--chinook, coho, sockeye and steelhead--has always been an important job on the Pacific Coast. For many years at the Columbia River dams, alert women sat at stations to watch the fish as they passed. The women identified and tabulated them as they flashed across a horizontally placed, white counting board set near the exits of fish ladders.

Now a closed-circuit TV camera, connected to a digital counter with a video-tape machine, is used to record the salmon as they migrate upstream.

The New Technique

At the Willamette Falls Fishway, in 1968, it was found that by placing a TV camera and video-tape equipment in the fish ladder, one person in about one hour could count fish

passing during a 24-hour period. Specially adapted triggering equipment makes it possible for the fish to turn the video tape recorder on and then off as they pass in front of the camera.

The new method was developed by the BCF Columbia Fisheries Program Office in Portland. The Fish Commission of Oregon is cooperating with BCF.

How It Works

Robert D. Pollock, hydraulic engineer with BCF, was instrumental in developing the TV video-tape technique. He explains that the fish counting and TV recording system is accomplished as water passes through 2 stainless steel tunnels; the inside walls of these tunnels are insulated. Electrodes are imbedded into the inner surface of each tunnel to make electrical contact with the water. The water's conductivity between these electrodes forms a very weak electrical shield. When a fish penetrates the shield, the circuit is broken, the video tape machine activated, and the fish is on TV.

The conductivity bridge principle to count fish was developed initially by BCF Seattle.

A fish-viewing window set between the 2 tunnels, placed end to end, allows a passing fish to trigger the first tunnel--and to activate the video-tape machine. As the fish proceeds past the second tunnel, the tape machine is automatically shut off. If the fish does not pass through the second tunnel, an automatic timer can be set to turn off the video machine at any selected time. This system provides 24-hour surveillance. It has the added advantage of being able to stop motion on playback to give positive fish identification.

Past experience has shown that fish passage is periodic. It may occur at various times during the year and during the day. The night count is 2 to 8% of the day count. By using video tape, it is possible to compress the maximum day's fish passage into about a one-hour reel, without fear of human error. Identification of salmon is made perfect by replaying the tape any number of times. For greater economy, the tape can be erased automatically and new pictures taken on the same roll.

Studies by the Fish Commission of Oregon and by BCF showed that as much as a 20% fish-counting error had been experienced on Columbia River dams. Use of a side-view window and TV video-tape counting reduces the chance of error to a minimum.

* * *

STATE PLANS TO DEVELOP WILLAMETTE'S SALMON POTENTIAL

A 10-year program to develop the potential for "self-sustained natural production" of Willamette River salmon and steelhead through intensive adult and juvenile planting was announced on April 16 by Robert W. Schoning, director, Oregon Fish Commission. He said the opportunity exists now to provide the sport and commercial fisheries of the Pacific Coast with an additional annual harvest of about 800,000 naturally produced fall chinook and coho salmon and summer and winter steelhead.

Contributing to this opportunity were recent improvements in water pollution control and water quality standards, and the correction of many fish-passage problems in the Willamette system. Most important is the $4 million fishway BCF and the Fish Commission have undertaken at Willamette Falls, "the historic natural barrier to upstream migration of summer and fall run salmon and steelhead."

The Potential

The contribution to Oregon alone from natural production in the Willamette River can be increased 500%, the Fish Commission believes. The annual processed value of Oregon's share of the increased commercial catch would approach $875,000. The increased sport harvest in Oregon would generate about $1.5 million spending a year by sport fishermen and provide 150,000 angler-days.

This great potential could be developed by 1979 for about $1.4 million to rear and transplant adult and juvenile fish into the Willamette system. When the program is complete, "the sport and commercial benefits to Oregon are expected to exceed annually the total cost necessary to achieve full development by 1979."

Planting Program Underway

The Fish Commission already has a planting program for these species. Since 1964,

the commission and the Fish and Wildlifee Service have developed successfully a nucleus run of fall chinook in the Willamette above the falls. Many adult and juvenile coho salmon and winter steelhead from commission hatcheries also have been transplanted into the Willamette sysem.

The results are obvious. Fall chinook, coho, and winter steelhead are returning to spawn in Willamette River tributaries "historically devoid of these fish." The 1968 runs of fall chinook and coho passing Willamette Falls were the largest on record.

However, the commission says the Willamette's unused potential "is so great that even at the current rate of progress there is no hope of achieving full development for all species in less than 30 years or more"--unless money and existing developmental efforts are increased appreciably.

Otherwise, Director Schoning says, Oregon will continue to forfeit for an unnecessarily long time much of the annual self-sustained economic and recreational benefits that full development would provide.

Catfish Farming Has Promise for South

Catfish farming, a new multi-million dollar agricultural enterprise, is opening up economic opportunities for many people in the southern United States, it is pointed out by the Soil Conservation Service of the Department of Agriculture.

This is real fish farming--planting, feeding, harvesting and marketing the fish on a scientific scale--and not just turning loose some catfish in a farm pond and charging a fee for fishing. Farmers, who in the past planted a few catfish in their farm ponds, are discovering that with a little management they can raise a profitable crop of fish every year. Some of those who have gone into commercial catfish farming are producing as much as 1,200 to 1,600 pounds of fish per acre of water with net returns of from $70 to $250 per acre.

There is, as far as we know, only one catfish hatchery in South Carolina--the Wadboo Hatchery at Moncks Corner. . . .

They [owners] started operating in March of 1968 and have already sold 130,000 fingerlings from the hatchery, the selling price being a penny an inch. They say they could have sold three times as many fingerlings if they had only had them.

The fingerlings went to persons who wished them for stocking their fishing ponds and to other persons who wished to raise them for eating.

The catfish, primarily the channel and blue species, are marketed through fee fishing, restaurants, fish markets and processors. Farmers either purchase or raise their own fingerlings and stock them in larger ponds in early spring. The fish are fed a high protein pelleted food throughout the season and are ready for harvest in the fall at weights of from one to two and one-half pounds. Some farmers keep them on feed for another year and market them at two and one-half to four pounds.

SCS technicians have helped many farmers throughout the South with information on selecting pond sites, design, and construction and on the management requirements needed to successfully raise catfish. They point out to prospective fish farmers that operation on a commercial scale takes a sizable investment and demands managerial skills.

The typical catfish farm consists of about 20 acres of surface water divided into about eight ponds ranging from one to four acres in size, although a few large scale farmers have as high as 400 acres under water.

At present there are more than 20 million pounds of catfish on feed throughout the southeast and frozen food processors are eying markets outside the South for a product they feel will compete with other foods. (This article is reprinted from 'South Carolina Wildlife,' Spring 1969.)

Texas

SHRIMP CREWMEN TRAIN AT FREEPORT

A shrimp crewmen training venture unique in Texas shrimping is underway at Freeport. Called the National Fisheries Training Center No. 1, it was established in November 1968. It is the first devoted solely to the overall training of apprentice rigmen for the Texas shrimping fleet.

Under a contract awarded by the U.S. Department of Labor to the Freeport Shrimp Association, a consortium of boat owners has been formed to participate in the program. The owners are sponsoring the training program and placing qualified trainees on board their boats during the on-the-job phase of the training schedule.

Origin of Program

This venture resulted from the realization by boat owners and individual boat captains that they had 2 prime difficulties: 1) There was a decided lack of men who could be recruited as crewmen. 2) Boat owners and captains were unable to furnish, on a recurring basis, the training required by the inexperienced personnel they were able to recruit. These people often lasted only 1 or 2 trips. Moreover, the time and facilities available for even rudimentary training of inexperienced personnel while on a trip seriously affected normal shrimping operations--to the point where trip costs rose and size of catch diminished.

The Disadvantaged

Quite apart from these difficulties was the training and jobs program under the auspices of the National Alliance of Businessmen to find gainful, permanent employment for disadvantaged people. In this category are male youths who are job hoppers, school dropouts, and who are on a low rung of the economic ladder. Their outlook went no farther than qualifying for the relief rolls. At this point, through the efforts of the Department of Labor, the NAB, and the Freeport Shrimp Association, the training program for the disadvantaged came into being.

The Training Program

Training at the National Fisheries Training Center No. 1 began in February 1969. A second training center is being established at Tampa, Florida, for the Florida Shrimp Association.

Applicants for the training center are certified by the State Employment Service. They enter the course of instruction at the rate of 10 a week at 2-week intervals. The first phase consists of on-shore training at the training center site and dockside. This is followed by 44 weeks of on-the-job training aboard an assigned shrimp boat.

Instruction includes the history of shrimping, net work and net repair, trawls and rigging, handling the catch, piloting and navigation, communications and voice procedures, engine and machinery maintenance, seamanship, safety at sea, and life at sea. Audio-visual aids play an important part.

Because of the nature and background of the trainees, a considerable part of the training effort is devoted to social counseling to develop positive, success attitudes. Trained counselors of long experience are part of the instruction staff. When needed, remedial instruction in reading, writing, and arithmetic is conducted. Technical instruction is aimed at producing trainees who, when the on-shore phase is completed, will have attained the status of apprentice crewmen--and full-fledged rigman status when on-the-job training is completed.

Trainees are paid at the rate of $1.60/hr. for a 40-hour week at the training center and during the 44 week on-the-job-phase. They also share in the catch.

NAMES OF FISHES

Daniel M. Cohen

Commercial fishermen, the food processing industry, anglers, scientists, writers, Federal and State agencies, students and teachers and many others use names of fishes. Communication about these animals is impaired because some kinds of fishes have no names, others have more than one name, and some names are used for more than one kind of fish. The obvious solution would be for every species of fish to have one name that was universally recognized as referring to it alone. This article briefly discusses some of the causes of the confusion surrounding fish names.

Because they are essentially less complex, let us first consider scientific (Latin) names. The rules for the formation and use of scientific names are governed by the voluntary adherence of zoologists to the International Code of Zoological Nomenclature, most recently revised and published in 1964. In essence, the Code tells us that a zoologist who finds a species that lacks a scientific name may describe the species and give it a Latinized name (subject to certain rules and recommendations).

The name is composed of two parts. Let us take as an example the goldfish, Carassius auratus. Carassius is the generic name; one or more species may be included in the genus and will have Carassius as the first part of its scientific name. The second part, auratus, is the specific name and refers to only one species of Carassius. Both names together, Carassius auratus, make up the scientific name for the species that we recognize as the goldfish.

The starting point for scientific names is a book by the Swedish biologist Linnaeus, published in 1758. No scientific names published before that date are admitted to the system. If for any reason a zoologist gives a scientific name to a species that already has one, the name with the earliest date after 1758 takes precedence. If for any reason the same scientific name is given to two species, the last-named one must be given a new name. This system offers a relatively stable method of communication. Poisson rouge in French, chin-yü in Chinese, chrusoparon in Greek, aranyhal in Hungarian, kingyo in Japanese, zolotoi ribki in Russian, and dorado in Spanish are all different names for what we call the goldfish. Communication about goldfish is difficult without the universally recognized Latin name, Carassius auratus. It is a world-wide code word.

International currency notwithstanding, scientific names cannot replace common names for several reasons. Latin has no meaning for the average person; having two words in a name is cumbersome; and scientific names are subject to change, for as well as being a way of communicating they serve as a working tool of the scientist who classifies animals, and as classifications change scientific names may do likewise.

Common names serve a variety of purposes and arise in many ways. In fact, the only characteristic they share is that they are not Latin. To understand common names properly, we should consider the different kinds.

Local or folk names are the largest class of common names. They are deeply entrenched in the language of a region, and are often obviously descriptive, but sometimes their origins are lost in the past. They may present as much variation within a single language as do goldfish names between languages. An example is Micropterus salmoides, widely known as the largemouth black bass. In a study of the common names applied to the fishes of the bass and sunfish family, Smith in 1903 listed 53 different common names for this species. A few of them are: big-mouthed trout in Kentucky; chub and welshman in North Carolina and Virginia; cow bass and moss bass in Indiana; grass bass in Minnesota; gray bass in Michigan; green trout in Louisiana; marsh bass, bride perch and pointed tail in Ohio; and perch, trout and jumper throughout the South. Of course, many of these names have died out, but the fact that they once existed and were useful in communicating within a region illustrates what one writer (Macleod, 1956) described as ". . .colloquial names that have grown up spontaneously among ordinary people."

The author is Research Systematic Zoologist, Systematics Laboratory, BCF, U.S. National Museum, Washington, D. C. 20560.

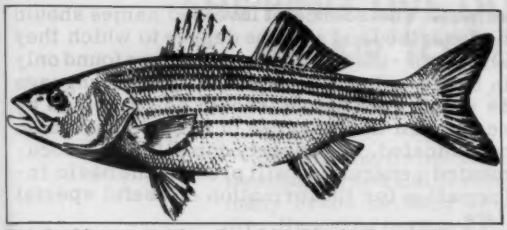

Fig. 1 - Morone saxatilis. Rockfish in Maryland, striped bass in California.

Another category of common names might be called coined or invented names. Many kinds of fishes are known to scientists alone and have only Latin names. If, in writing of one of these animals a common name is required, one is invented. The American Fisheries Society (1960) has listed all known kinds of fishes living in the United States and Canada to a depth of 100 fathoms. Some of the fishes on this list previously lacked any common name, and others shared a common name with one or more species. In order to insure a single common name for every species on the list, a number of names were invented. Another reason for inventing names is the importation into the United States of species from non-English speaking regions. The aquarium trade is the best example; a brief perusal of any authoritative book on aquarium fishes (for example, Sterba, 1967) will show many fishes from South America and Africa for which English language names have been invented. In a recent popular booklet on Californian deepsea fishes, Fitch and Lavenberg (1968) invented common names for species that previously lacked them. In some situations, scientists who describe a previously unknown species and give it a Latin name also invent a common name. This practice is very common in Japan.

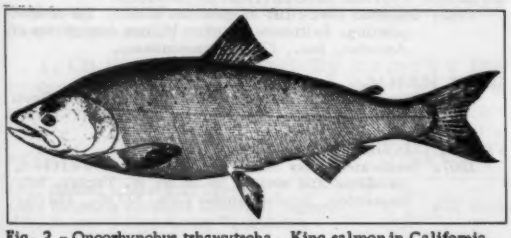

Fig. 2 - Oncorhynchus tshawytscha. King salmon in California, chinook in Alaska.

The chief problem, however, lies with fishes that have too many names rather than with those that require invented ones. The commercial fishing industry, State and Federal agencies, and writers communicate about fishes chiefly by using common names. When a species has more than one common name, and there is a clear need for only one, it may be a major undertaking to decide which should be used. In some instances one of many local names is selected, in others an invented name is chosen. The basic reason for the choice of any name should be that it is understood by the widest audience.

In the Bureau of Commercial Fisheries publication 'Fishery Statistics of the United States' (Lyles, 1966) a glossary is presented, which lists scientific and common names, including for many species alternative common names. The names used are those with which the Bureau is best able to communicate with the various segments of the fishing industry.

The Food and Drug Administration is concerned with names of food fishes and deals with a set of names that might be termed semilegal. This agency is charged with maintaining standards of identity and its regulations require that labeling must not be false or misleading. In deciding what common names may be used by the food processing and distributing industries, they select (when such exists) a name that is common or usual from the viewpoint of the general public who use and purchase fish products. Allowable names are decided on a case-by-case basis.

Because they often write for a wide audience, sportswriters are another group requiring common names that do not vary regionally. The Outdoor Writers Association of America (1962) has attempted to promote stability by publishing a list of scientific and common names of principal American sportfishes. Although they hope their common names are widely accepted, they have annotated their list and presented many widely used alternative names.

The scientific community depends chiefly on The American Fisheries Society (1960) list of U.S. and Canadian fishes, a comprehensive and authoritative guide to scientific names; however, its common name section is of limited value because of inadequate coverage of alternative common names.

Users of common names have strong attachments to the familiar. Names of objects are so important to us that we tend to merge the name with the idea of the object. The idea of a piece of leather tied around the foot,

and the name of the piece of leather as a shoe, are virtually inseparable. Therefore, in addition to serving as a shorthand way of communicating, names become part of the total concept of an object. Consider, for example, an angler who associates the fish that scientists know as Micropterus salmoides with the name green trout. If he is served in thinking about M. salmoides or in communicating with others about it by the name green trout, and if the name largemouth bass has no meaning, then to him green trout is that kind of fish, official pronouncements notwithstanding.

If communication problems increase, the number of official lists of names may do likewise. When common names are required for legal reasons or other special purposes, a single name for each species is clearly desirable, and special lists will fill a real need in designating names that offer the best communication value for a particular purpose. A general list of fish names should serve a very different purpose. It may recommend a preferred name, but its chief function should be to report on and cross-index names that actually are used. The worth of any general list of names as an aid to communication and understanding is only as great as the scope of its coverage of alternative names and the basic documentation it presents. A general list should first of all tell its users whether names are invented or folk names. The source of invented names should be described and also the degree to which they are used--that is, whether they are found only in books or have entered the spoken language as well. Folk names should be presented by region and their degree of usage should also be indicated. A properly compiled and documented general list will present the basic information for the formation of useful special lists.

In summary, names of fishes are basically of two kinds, invented and folk names. Scientific names are invented and are usually, but not always, stable; however, they are not suitable for everyday use. Some common names are also invented and may be important, as for fishes imported from foreign language regions. Folk names may vary regionally. They originate in many ways and their usage is often deeply rooted. Various segments of the common-name-using public often use different names for the same species or the same name for different species. Because many common names have a high communication value and have also become part of the idea of the animal, it will probably be impossible for each species to have one common name that refers to that species alone. Users of common names for special purposes have attempted to list the names that serve them best. A well-documented general list, including alternative names, is needed.

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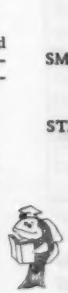

SHIPPING LIVE DUNGENESS CRABS BY AIR TO RETAIL MARKET

H. J. Barnett, R. W. Nelson, and P. J. Hunter

During shipments of live Dungeness crabs from Washington and California to distant retail markets, many crabs in each shipment die; frequently, all die. Reported here is a study made by BCF's Seattle Technological Laboratory to reduce these losses. As a result of this study, live Dungeness crabs can now be shipped by air, with a maximum loss of 5 percent, to any major city in the U.S.

Air shipment of live Dungeness crabs to retail markets was begun about 2 years ago by crab processors in California and Washington. The main outlet for the live crabs was in the Hawaiian Islands, where the shippers found a ready market. However, crabs in the early shipments suffered from high mortalities during transit and during holding after arrival. Frequently, the mortality was 100 percent.

In trying to solve this problem, the BCF Technology Laboratory in Seattle, Wash., began a cooperative study with a local shipper to improve the method of shipping.

RECOMMENDATIONS

The successful transportation of live Dungeness crabs by air requires proper handling before shipment, adequate packaging, and proper handling after shipment.

A. Handling Before Shipment

The methods presently used by the crab industry are not always conducive to marketing crabs in top-quality condition. The following steps are recommended to ensure that only crabs of highest quality are used for live shipments:

1. On the vessel, carefully remove the crabs from the pots and place them in a live well supplied with fresh, circulating seawater. Keep the injured and weak crabs separate from the uninjured and strong ones.

2. At the shore plant, carefully place the crabs in a live tank equipped to provide fresh, cool, flowing seawater. For best results, store the crabs in the holding tank at a ratio of no more than 2 lbs. of crab per square foot of storage area.

3. Keep the crabs in the holding tank for at least 24 hours prior to shipping. Promptly remove any injured or weak crabs. (During this holding period, the crabs do not need to be fed.)

4. Do not allow the crabs that are to be air shipped live to be held dry--that is, out of the water. (Although holding crabs out of water is common practice in preparing them for cooking, such practice is detrimental because it causes the gills to become dry. This causes the crabs to weaken and die relatively soon.)

B. Packaging for Shipment

Although great importance must be attached to the handling of crabs prior to shipment, even greater importance must be attached to procedures and materials used for packing live crabs. The critical factors are (1) the prevention of injury and (2) the control of temperature and humidity.

1. Prevention of Injury

Injury, which is caused by rough handling and improper packing, kills crabs. Tests have proved that losses are largely eliminated when crabs are properly handled and protected

Mr. Barnett is Research Chemist
Mr. Nelson is Research Chemical Engineer
Mr. Hunter is Engineering Technician
} BCF Technology Laboratory, 2725 Montlake Blvd. E., Seattle, Wash. 98102.

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against damage. In laboratory experiments, various packing materials were evaluated for their ability to prevent injury. Materials tested included burlap, newsprints, wood shavings, seaweeds, and cellulose blankets. The most effective material was an embossed, crepe-cellulose, fiber blanket called Kimpack.1/ This material not only cushioned the crabs from shock but, when moistened, increased humidity in the container. It is easily stored and inexpensive. A half square yard of ½-inch-thick Kimpak, for example, is enough to pack 50 pounds of crab in a Wet-Lok crab shipper and costs about 35 cents.

Banding claws to reduce injury, using methods developed for lobsters, was also tried. Banding proved awkward, time consuming, and not necessary.

2. Control of Temperature and Humidity

The control of temperature and humidity in packaged live crabs is of paramount importance. In laboratory tests, crabs were kept alive and in good condition for from 1 to 3 days under ideal conditions--at cool temperatures from 35° to 50° F., and at high relative humidities of 80 to 100 percent. When exposed to environments of temperatures above 50° F. and humidities below 70 percent, the crabs survived less than ½ day.

Temperature and humidity during shipment can be controlled by using a suitable shipping container. The container must be insulated, leak-proof, light in weight, easy to handle, and reasonably strong. A strong container helps to protect the live crabs from external sources of damage.

At present, several containers on the market meet most or all the requirements. These containers are variously constructed of foamed polystyrene liners supported by corrugated fiberboard master cartons, or by waxed and resin-impregnated fiberboard insulated with waxed (exterior) double-corrugated fiberboard.

The foamed polystyrene containers are suitable for shipping live crabs and are used extensively for shipping live lobsters. These containers cost 2 or more dollars each in quantity lots. However, a cheaper foamed plastic container, developed by BCF's Gloucester (Mass.) Technology Laboratory, was recently introduced. Good results were obtained when the BCF container was used in shipping live crabs. It costs about $1.50 each in quantity lots.

Most of our experiments were made using a modified insulated Wet-Lok container (wax and resin-impregnated fiberboard) designed by us in cooperation with a local paper company. The insulated Wet-Lok has the characteristics necessary for safe shipment of live crabs and is relatively inexpensive. This fiberboard container costs about 90 cents each when bought in quantity.

In addition to adequate packing materials and shipping containers, a suitable refrigerant also is needed. One of the best approaches to refrigerating live crabs during shipment is to use gel-ice (sometimes called Zero Pack or Reusable Ice1/). Gel-ice, besides being a good refrigerant, is not liquid at temperatures above the melting point of ice, and it is nontoxic. In quantity lots, a 3-pound pack costs about 10 cents a pound.

Based on laboratory and commercial results, BCF's Technology Laboratory at Seattle recommends the following procedures for handling and air shipping live Dungeness crabs:

1. Select an insulated and leakproof container capable of holding about 50 pounds of crab.

2. Place about 12 pounds of frozen gel-ice (the 3-pound pack version) or its equivalent in the bottom of the container.

3. Cover the gel-ice with a single pad of moist material, such as Kimpak, and prechill the container and packing material at 0° F., or colder, for at least an hour (Figure 1).

4. After carefully prechilling the container, load it with live crabs (Figure 2).

5. Layer the crabs (Figure 3) in the container. Separate the layers with a single pad of moist material, such as Kimpak. Cover the top layer of crabs with a single moist pad. Depending on size and weight of crabs, do not pack container with more than 20 to 25 live crabs, or about 50 pounds.

6. Place the top of the container in position (Figure 4), and secure the container and top with double strapping. Mark container appropriately--for example, "Live Crabs," "Keep in Cool Place," "This Side Up," "Do Not Freeze."

7. Ship the crabs as soon as possible after they are packaged.

1/Trade names mentioned do not imply endorsement but are used only to simplify descriptions.

8. Notify forwarding agent that live crabs are being shipped so extra care can be given during shipment.

Crabs so packed will survive out of water for 25 to 30 hours at ambient temperatures -- from 65° to 75° F.

Fig. 1 - Modified Wet-Lok crab shipper prepared with gel-ice and moist Kimpak prior to prechilling.

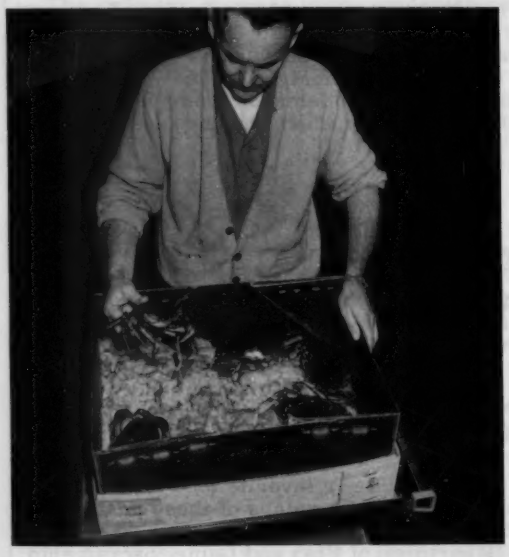


Fig. 2 - Loading live crabs into the shipper.

Fig. 3 - Layering live crabs in the shipper.

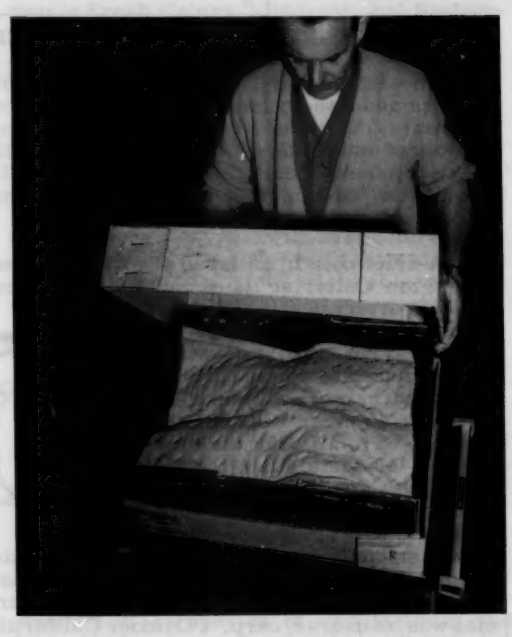


Fig. 4 - Placing container top into position prior to strapping.

C. Handling After Shipment

On arrival, the crabs should be examined immediately. Weak crabs should be removed and processed immediately--cooked. The remaining crabs should be placed in a seawater live tank; the water should be circulated at a rate of 10 to 15 gallons per minute and refrigerated at 40° to 50° F. If natural seawater is not available, synthetic seawater can be substituted. (Synthetic seawater salts are available from commercial sources.) If the crabs are displayed in a closed system, such as a lobster-display tank, the water must be filtered. Although glass-wool filters are commonly used in display tanks, we recommend sand filters.

MARKET POTENTIAL

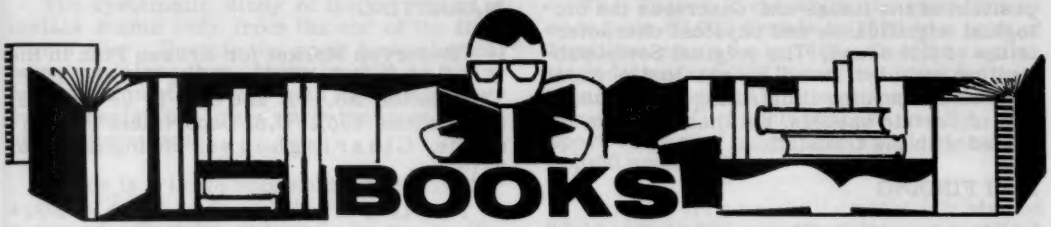
The market for live Dungeness crabs is substantial. Since crabs were introduced to the Hawaiian Islands about 2 years ago, sales have more than doubled. The potential market in the Midwest and East also appears good. Test and commercial shipments of live Dungeness crabs into these areas indicate demand for this type of product would be more than several million pounds a year.

While the Dungeness crab industry is trying to expand its markets through diversification of its product and increased advertising, marketing these crabs alive apparently would fit into the picture readily. If developed in the same manner that the live-lobster industry was, the live-crab industry should be successful.

A DIFFERENCE IN PHILOSOPHY

The introduction of carp into North America during the late 1800's is viewed by most anglers and fishery managers as a mistake of gigantic proportions. During the intervening years, carp and similar species--generally classed as "trash fish"--have been the objects of extensive, expensive, and often futile eradication campaigns. Even small numbers of carp in favorite trout and bass waters evoke demands from anglers to "do something" to get rid of them. In this country, then, the carp is damned, despised, and destroyed.

A brief note in an issue of 'The Progressive Fish Culturist' is of particular interest since it dramatically illustrates the differences in outlook between East and West. In India, a country badly in need of animal protein, fishery workers were having problems--as they seem to have all over the world. Mosquito-fish, the same species so popular in the United States for use in mosquito control programs, were seriously interfering with the production of one of their favorite food fish. Consequently, a chemical control program was instituted to rid their waters of these pests. The program was successful and soon their waters teemed with the favored species. This species was, of course, carp. ('Outdoor California,' Department of Fish and Game, Sacramento, California.)



DEMERSAL FISHES

"Demersal Fish Resources: Composition, Distribution, and Commercial Potential of the Continental Shelf Stocks off Southeastern United States," by Paul Struhsaker, 'Fishery Industrial Research,' Vol. 4, No. 7, Fish & Wildlife Service, Department of the Interior, 1969, pp. 261-300, illus. Available from Division of Publications, 1801 N. Moore St., Arlington, Va. 22209.

The Bureau of Commercial Fisheries and other agencies have been exploring the waters bordering the southeastern U.S. since 1950. The exploratory fishing vessel 'Silver Bay' conducted trawling explorations for offshore demersal fishes in this area from 1959 to 1964. This report summarizes and evaluates the results.

The primary purpose of the explorations was to determine the commercial potential of the offshore demersal stocks. There were two other aims--to find offshore concentrations of species that could be used immediately by the fishing industry, and to obtain a picture of the distribution and availability of demersal fish stocks as they are related to the general features of the shelf environment.

The most productive grounds were found off northeastern Florida and South Carolina, although isolated productive areas occurred along most of the southeastern coast. Mr. Struhsaker reports that moderate-to-large catches of snappers, groupers, porgies, and ecologically associated species can be consistently made with roller-rigged New England-type fish trawls. He estimates, conservatively, that proper use of the resources could at least double the present annual landings of snappers and groupers in the area.

The report includes a fishing log and chart of 50 stations, where catches of commercial size were made, and a list of demersal fishes taken during the exploration, with notations on their occurrences in the trawl catches.

DOLPHINS

"The Dolphin, Cousin to Man," by Robert Stenuit, Sterling Publishing Co., New York, 1968, xv + 176 pp., illus.

Robert Stenuit, oceanographer, world-famous diver and author, has been deeply interested in dolphins since his first contact with them in 1964. In this fascinating introduction to the study of dolphins, he discusses all aspects--biology, intelligence, domesticability--and their future as active partners with man in exploitation of the sea.

FRESHWATER FISH

"Methods for Assessment of Fish Production in Fresh Waters," International Biological Program Handbook No. 3, edited by W. E. Ricker, Blackwell Scientific Publications, Oxford & Edinburgh, 1968, 313 pp., illus.

This is a companion volume to the "Biological Basis of Freshwater Fish Production" (CFR, Dec. 1968). It is aimed at biologists who have basic university training in zoology and some knowledge of ecology and freshwater biology, but with no special experience in research on fish. With the aid of this handbook, such biologists will be able to carry out worthwhile and rewarding research in fish production in any part of the world.

FISH 'VOICES'

"An Atlas of Fish Sounds," edited by B.P. Manteifel (in serial report 'Translations of USSR Resources No. 3'), JPRS Trans. No. 47,707, 46 pp., $3. Available from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151.

Published in the USSR in 1968, this atlas contains data on the characteristics of the 'voices' of 79 species of cartilaginous and bony fishes, mostly marine. It includes sounds of feeding, maneuvering of schools, threat, and others. It gives the taxonomic

position of the fishes and describes the biological significance and physical characteristics of fish sound. The original Soviet publication included sound graphs and a phono disc with recording illustrating 'vocal' abilities of certain species, but these are not included with the translation.

FISH FINDING

"Fish Location by Hydroacoustic Devices," by V.G. Azhazha and E.V. Shishkova, Pishchepromizdat, Moscow, 1960. Translation No. TT 67-51265, 1968, 113 pp., illus. U.S. Department of Commerce, Clearinghouse, Springfield, Va. 22151.

Sonar is an apparatus that detects the presence and location of a submerged object by means of sonic and supersonic waves reflected back to it from the object. It is widely used for measuring the depth of the sea and locating coasts, ships, and shoals of fish.

This is a Soviet textbook on the use of hydroacoustic instruments on scouting and fishing vessels. It explains the physical principles of fish finding, sonar computations, and the practical aspects of using hydroacoustic equipment. The Soviet-made NEL 5r is described in detail because it incorporates all the elements typical of other types of echo sounders.

FISH HOLDS

"Care of Fish Holds," by Wayne I. Tretsven, 'Fishery Industrial Research,' Vol. 4, No. 6, 1969, Fish & Wildlife Service, Department of the Interior, Washington, D.C. Available from Division of Publications, 1801 N. Moore St., Arlington, Va. 22209.

Holds in fishing vessels have long been a problem. Difficult or impossible to clean, they are often the cause of unnecessary spoilage of fish. Mr. Tretsven suggests methods of cleaning and sanitizing the hold, and applying a preservative to wooden holds. He recommends an approved fungicide for treatment of wood in the holds. Reporting on the effectiveness of lining the hold with polyethylene sheeting, he concludes that it is a practical method for keeping fish and ice from contact with the hold, and for keeping the hold clean and dry.

MARKETING

"Report on Market for Frozen Fish in the U.S.," by Dag Halland and Stig Valland, 1968, Translation No. PB 182 816 T, 94 pp., $3, (microfiche 65¢). U.S. Department of Commerce, Clearinghouse, Springfield, Va. 22151.

This is a report on the results of a research project conducted in the U.S. for 3 months during the summer of 1968. Halland and Valland give their views of the U.S. marketing system, the structure of the European fishing industry, centralized versus decentralized exports, and the most profitable alternatives. Concluding that present conditions on the U.S. market are unfavorable to Norwegian frozen fish exporters, they suggest that better marketing techniques should give Norway a bigger share of this market. Her present share is only 10%.

PROCESSING

"Rapid Method for the Estimation of EDTA (Ethylenediaminetetraacetic acid) in Fish Flesh and Crab Meat," by Herman S. Groninger and Kenneth R. Brandt, 'Fishery Industrial Research,' Vol. 4, No. 6, 1969, Fish & Wildlife Service, Dept. of the Interior, Washington, D.C. Available from Division of Publications, 1801 N. Moore St., Arlington, Va. 22209.

EDTA has been reported useful, or potentially useful, as an additive to seafoods to stabilize color, retard the formation of struvite, inhibit enzyme-catalyzed changes in flavor, and to inhibit the growth of bacteria. Since EDTA often is applied by spraying or dipping the seafood, the amount of EDTA actually added must be determined by a suitable quantitative method.

This paper describes a simple and rapid method giving about 90% recovery of added EDTA from fish flesh and crab meat.

MARINE CORROSION

"Marine Corrosion," by T. Howard Rogers, George Newnes Ltd., London, 1968, 307 pp., illus.

Corrosion is an insidious consumer of our stocks of raw materials, a squanderer of our productive capacity, and a dissipator of the fruits of our labors.

The systematic study of the corrosion of metals stems only from the end of the first World War. Despite the great technological advances since then, there is still no cheap construction steel alloy with any better corrosion resistance to sea water than was available 100 years ago.

There is a large volume of corrosion literature, but it is distributed over a wide range of scientific and trade journals. Mr. Rogers has attempted to cover the corrosion problems of the marine and ship building industries in a single volume.

OCEANOGRAPHY

"The Waters of the Sea," by P. Groen, D. Van Nostrand, Princeton, N.J., xiv + 328 pp., illus.

This is a book about the sea, with particular reference to its physics. A highly readable and descriptive work, it is intended primarily for students of geography, marine geology, marine biology, and students in nautical schools. It covers exploration of the oceans, water of the sea, sea ice, waves, ebb and flow ocean currents, and energy exchange in the oceans.

OYSTERS (TECHNOLOGY)

"Opening Oysters and Other Bivalves Using Microwave Energy," by Joseph M. Mendelsohn, et. al. 'Fishery Industrial Research,' Vol. 4, No. 7, Fish & Wildlife Service, Department of the Interior, Washington, D.C., pp. 241-248, illus. Available from Division of Publications, BCF, 1801 N. Moore St., Arlington, Va. 22209.

Opening the shells of oysters and of other bivalves is difficult, time-consuming, and potentially dangerous. The rate of production of an inexperienced shucker is so low that he cannot earn the wages he must receive under minimum wage laws. This paper discusses the microwave process, and concludes that it is more efficient and less expensive than shucking by hand.

STURGEON

"Age, Growth, Food, and Yield of the White Sturgeon (Acipenser transmontanus) of the Fraser River, British Columbia," by S. N. Semakula and P. A. Larkin, article, 'Journal of the Fisheries Research Board of Canada,' Vol. 25, No. 12, 1968, pp. 2589-2602, illus.

The Fraser River white sturgeon fishery rose from 80,000 pounds in 1880 to a peak of 1 million pounds in 1897. Despite regulations dating from 1911, catches have declined steadily. Since 1918, commercial catch has ranged from 10-50,000 pounds annually. The sport fishery might take an additional 20-30,000 pounds a year.

This report concludes that a sustained yield of about 25% more than the present catch is possible; also, a trial fishery for 2 or 3 years, taking about 100,000 pounds per year, may be warranted.

TESTING EQUIPMENT

"An Improved Fish Measuring Board," by C. W. Woods, Publication No. 125, Fisheries Research Division, Marine Department, Wellington, N. Z. Reprinted from 'N. Z. Jl. mar. Freshwat. Res.', Vol. 2, No. 4, pp. 678-83, illus.

Measurements of fish length are subject to many forms of error; one is number bias. This may be unimportant if the measurements are made to a greater accuracy than is required for analysis, but it can waste time. C. W. Woods describes a fish-measuring board that permits rapid and easy length measurement to be made without a number bias.

TUNA

"Tuna Distribution & Migration," by Hiroshi Nakamura, Fishing News (Books) Ltd., London, 1969, 76 pp., illus.

Water temperature has long been considered a primary factor in controlling fish distribution. On the basis of data on occurrence, size composition, spawning, feeding, etc., of tunas, Nakamura published a set of hypotheses on the distribution and migrations of tunal in relation to ocean currents in 1954. This book revises his hypotheses in the light of information obtained since then. All the results of his investigations seem to support his opinion that "an area covered by a certain ocean current is a distinct habitat of tunas, a discrete ecological sphere."

SALES PROMOTION

"The Nautical Way," Book Department, Institutions Magazine, Chicago, 1969, 104 pp., illus., $3.95.

This book is a sales-promotion effort for fish and seafood. It includes information on food service operations, equipment, products and purchasing, preparation recommendations, merchandising ideas, and 100 fish and seafood recipes.

TURTLES

"On the Coast of Tamaulipas," by Humberto Chavez, Martin Contreras G., and T. P. Eduardo Hernandez D., reprinted from 'International Turtle & Tortoise Society Journal,' Vol. 2, Nos. 4 & 5, 1968, 21 pp., illus.

The region of Rancho Nuevo, Tamaulipas, is the only important nesting zone of the ridley turtle, Lepidochelys kempi (Garman) in its entire geographic distribution. Sale of its eggs is forbidden by Mexican law. However, in 1963, it was estimated conservatively that 80 to 90% of the nests were destroyed by men on the day of their construction.

An arrival of 40,000 specimens was recorded in 1947. But by 1966 the largest arrival observed had less than 2,000 turtles. A program to study their biology, and to develop a plan to protect them, was initiated by the Mexican government in 1966. This is a report on a $3\frac{1}{2}$-month study made in 1966. It includes a description of the turtle's nesting and biology.

VANISHING SPECIES

"The Canterbury Mudfish, Galaxias burrowsius Phillips, A Vanishing Species," by W. Skrzynski, Publication No. 122, Fisheries Research Division, Marine Dept., Wellington, N. Z. Reprinted from 'N. Z. Jl. mar. & Freshwat. Res.', Vol. 2, No. 4. Dec. 1968, pp. 688-87, illus.

Galaxias burrowsius is able to survive out of water in damp earth for long periods. It can be assumed that it occupies isolated waters that dry periodically, and where it probably has no competition from other fish. Such waters, once common on the Canterbury Plains, have been almost eliminated by draining or connection to rivers and artificial channels. Mr. Skrzynski, believing it unlikely that G. burrowsius will continue to survive, has summarized all available information on it in this paper.

WHALES

"The Whale," Simon & Schuster, New York, 1968, 287 pp., illus., $20.

This is a beautiful book; it contains 267 illustrations, 87 in full color, including drawings, paintings, ancient woodcuts, old whaling prints, and photographs of contemporary whaling operations. But it is far more than a book to look at. It tells the myths and stories of whales throughout history. It includes a complete natural history of every species of whale and dolphin. And it provides a detailed history and description of whaling from earliest times to the present. A most complete and definitive review of a fascinating creature.

The main author and supervising editor is the former director of the Zoological Society of London, Dr. Leonard Harrison Matthews, F.R.S. Scientists from the important whaling countries have helped to make the book a product of complete international cooperation.

--Barbara Lundy

INTERNATIONAL

Tuna Treaty Comes Into Force

An international treaty aimed at scientific management of heavily fished tuna stocks in the Atlantic entered into force on March 21, 1969, when Spain became the seventh nation to ratify it.

The International Convention for the Conservation of Atlantic Tunas was drafted in Rio de Janeiro, Brazil, in May 1966, under auspices of the Food and Agriculture Organization (FAO) of the United Nations. Six countries had previously been parties to it: U.S., Japan, Ghana, Republic of South Africa, France, and Canada. With the seventh, Spain, the Convention automatically took effect.

The Convention provides for setting up an international commission to recommend scientific management of tuna fishing in the Atlantic to protect and preserve the stocks.

Decreasing Catches

Fishing for tuna in the Atlantic Ocean has increased greatly in recent years. Despite the increase, catches have not risen appreciably. Yellowfin catches have actually declined--from an estimated 68,000 metric tons in 1964 to 60,000 in 1966. At an FAO meeting in Miami, Florida, in 1968, experts warned that tuna stocks, while on the whole plentiful, needed supervision to prevent overfishing. (FAO, Mar. 22, 1969.)

FAO Publishes Guide on National Coastal Waters

How far do the territorial waters of nations extend out to sea? A survey shows claims ranging from 3 to 12 miles for most nations and up to 200 for some.

The survey, first of its kind, was prepared by FAO and covers 102 coastal nations (excluding Mainland China). It includes information on exclusive fishing zones, fishery conservation zones, and claims regarding continental-shelf exploitation.

3, 12, 200 Miles

The survey shows 28 nations have a 3-mile limit. These include France, Japan, the United Kingdom, and the U.S.

Thirty-one others, including the USSR, claim 12 miles.

At least 6 countries--including Argentina, Costa Rica, Ecuador, El Salvador, Panama, and Peru--claim a full 200-mile territorial sea or exclusive fishing zone.

About 40 countries with a narrow territorial sea also claim exclusive fishing zones beyond this area, usually up to 12 miles from the coast.

International Conventions

The survey also lists the parties to the 1958 Convention on the Territorial Sea and Contiguous Zone, the 1958 Convention of the Continental Shelf, and the signatories of the 1964 European Fishery Convention. The latter, not yet in force, was the first multilateral agreement recognizing a maximum 6-nautical-mile limit for the territorial sea, and a further 6-nautical-mile maximum exclusive fishing zone.

The document was prepared by FAO as guide to the status of national coastal waters, principally for fishery purposes. It does not express opinion on national claims. (FAO, Mar. 14.)

Japan & USSR Open NW Pacific Fisheries Meeting

The Japan-USSR Northwest Pacific Fisheries Commission met in Tokyo on April 2. It discussed salmon, herring, and other fish catches in the northwest Pacific. The Tokyo talks were delayed over a month by the drawn-out king crab negotiations in Moscow. Japan feared the discussions would not be ended by April 30, when the Japanese salmon fleet normally departs for Area B (south of 45° N. latitude).

Since 1969 is a dominant year for Asian pink salmon, a major point of the talks was whether the USSR would agree to set this year's Japanese salmon catch quota at or above 108,000 metric tons. That was the quantity allotted to Japan in the previous good pink year of 1967.

1968 Salmon Catch Data

On March 31, the Japanese Fisheries Agency released data on the 1968 salmon catches of both countries. The Soviet catch, 40,177 tons, fell about one-third short of the target. The Japanese catch in Area A (north of 45° N. latitude) just reached the quota of 46,500 tons, but in Area B it fell about 900 tons below assigned quota. The short catch was attributed to an abnormal occurrence of plankton, causing poor bait biting in the long-line fishery. ('Suisan Tsushin,' Apr. 2.)

Japan-USSR Salmon Catches, 1966-68

	1968	1967	1966
	(Metric Tons)		
Japan			
Area A:			
Catch quota	46,500	52,500	48,000
Actual catch:	46,365	52,333	47,782
Mothership fishery	37,642	42,544	38,930
Drift gill-net fishery	8,723	9,789	8,852
Area B:			
Catch quota	46,500	55,500	48,000
Actual catch:	45,647	62,540	53,395
Drift gill-net fishery	30,867	41,883	32,251
Long-line "	7,779	16,958	14,678
Japan Sea gill-net fishery	3,493	3,699	3,015
Small-vessel gill-net fishery	3,508	-	3,451
Coastal trap fishery	2/ 11,098	2/ 13,581	22,145
Total 1/	103,110	128,454	123,322
USSR			
Planned catch	60,000	83,000	65,000
Actual catch	40,177	78,000	56,223

1/Total area A & B actual catch & coastal trap fishery catch.
2/Jan.-Sept. catch.

Italian-Ivory Coast Tuna Company Formed

A joint Italian-Ivory Coast company is planning to fish tuna out of Abidjan. It will have 6 tuna seiners with freezing capacity for at least 350 tons of raw tuna. The vessels will be built in Italy from French designs based on U.S.-type vessels. They will be able to fish for sardines as well. Each will be about 145 feet long with 1,800 hp. The vessels will be managed by the Société Ivoirienne de Pêche et d'Armement (SIPAR).

European Market

Tuna landed from the new company's vessels will be shipped to Italy, either frozen or canned. Tuna also may be shipped to other members of the European Common Market.

Norwegian Firm Opens Sales Center in Czechoslovakia

Frionor (Norsk Frossenfisk A/L), a Norwegian firm has opened a sales center in Prague. The 1,500-square-foot center includes a self-service shop for fish products, a fish demonstration section, and a snack bar. The technical equipment, including freezers, is Norwegian. The center, to be operated by Czechoslovakians, represents an investment of US$280,000. One-sixth of the money came from a Norwegian Government fund to promote fishery exports.

Czechoslovakia A Major Market

Czechoslovakia is a major market for Norway's frozen fish fillets. Frionor has exclusive right to export Norwegian frozen fish fillets to Eastern Europe. It currently sells 5,000 metric tons of frozen saithe fillets, and 1,500 tons of other fish fillets to Czechoslovakia annually.

To Promote More Highly Processed Products

Besides promoting sales of frozen fish fillets, the center hopes to develop Czechoslovak tastes for more highly processed products. Current exports are mainly standard packs, but Frionor plans to increase the supply of consumer packed frozen fish fillets under its own brand name.

Frionor sales centers are supposedly being planned for Moscow and Budapest. (U.S. Embassy, Oslo, Mar. 7, 1969.)

Canada Seizes Japanese Fishing Vessel

On Feb. 25, 1969, a Canadian patrol boat seized the Japanese fishing vessel 'Kotoshiro Maru' (480 gross tons) within 12 miles off British Columbia. Canadian authorities reportedly will prosecute the captain and 31 crewmen on charges of violating Canada's 12-mile exclusive fishery zone. This is the first time Canada has seized a Japanese fishing vessel. ('Minato Shimbun,' Mar. 1.)

Japan-USSR Crab Talks End

The Japan-USSR crab negotiations held in Moscow since Feb. 6, 1969, were concluded on April 11, with the signing of a one-year agreement.

Japan's 1969 quota of king crab and tanner crab in the northwest Pacific is about 20% and 26% less, respectively, than actual 1968 production. In the Okhotsk Sea, off western Kamchatka, Japan's king crab quota is 216,000 cases.

Japan is reported to have accepted the Soviet demand for a complete ban on fishing of blue crab (a king crab) off Cape Olyutorski. In 1968 Japan operated one fleet, producing 48,000 cases. Japan also accepted a ban on tanner crab fishing off the Maritime Province of Siberia. Twelve Japanese fleets harvested 3.6 million tanner crabs in 1968.

Soviet negotiators had contended that the crabs are Soviet Continental Shelf resources, but after considerable argument with the Japanese, the matter was set aside. ('Kanzume Nippo,' Apr. 5 & 14.)

Japan Considers 12-Mile Fishing Zone

The Japanese Government, spurred by Soviet mackerel fishing off Japan, is studying establishment of a 12-mile exclusive fishery zone. However, the Government may not readily reach a decision since Japan stands to lose more than she would gain. Adoption of a 12-mile limit would affect adversely Japan's distant-water tuna and trawl operators. Their operations in the 12-mile zones of foreign countries yield an annual production worth about US$55.6 million.

Japan also would find herself unable to oppose extension of sea limits by other countries. She would no longer be able to ignore the legal questions of jurisdictional rights over resources in negotiating agreements with foreign countries.

Government's Dilemma

There is a large difference between 3 and 12 miles in the tuna fishery, especially off the Pacific islands and in distant-water trawling. Japanese vessels cannot operate profitably in the eastern Bering Sea and the Atlantic unless they are allowed to fish within the 12-mile zones of other countries.

The problem is that more nations are tending to recognize a 12-mile jurisdiction. Pressure is also building among Japanese coastal fishermen, lawmakers, and news media to widen the fishery limit. ('Suisan Tsushin,' Mar. 20.)

Soviet Vessel Finds Commercial Shrimp Quantities Off Tunisia

Significant commercial quantities of shrimp were discovered in the Gulf of Gabes off Tunisia's east coast. They were discovered during a FAO study cruise by the Soviet research vessel 'Akademik Knipovich' in the Mediterranean from Nov. 3 to Dec. 1, 1968. The largest catch per hour of trawling was 154 lbs., compared to an average of 44-55 lbs. in the Gulf of Mexico. FAO scientists believe the resource is large enough to make commercial shrimp trawling with small vessels profitable.

Some concentrations of sardines were found. Reasonably good catches of shrimp were made in depths of more than 100 meters (50 fathoms) on the Algerian Continental Shelf.

The Tunisian and Algerian governments will be provided with data collected during the cruise. FAO believes the information may be important to the fishing industries of both countries.

Underwater Fish Tagging

A cruise highlight was an undersea demonstration in fish-tagging techniques by Erdogan F. Akyüz, FAO marine biologist from Turkey. Akyüz dived to 100 feet off Tunisia to tag fish held in the trawl. Colored plastic identification markers were inserted into the fish to trace their growth, migration patterns, and behavior. The tagged fish were kept in a large metal cage to see whether the tagging had been successful and to evaluate the usefulness of various tags.

The tagging demonstration showed that fishery studies and research can be moved from laboratories into the sea.

Joint USSR-FAO Project

The cruise was organized by FAO and the USSR under the United Nations Development Program (UNDP). Its purpose was to provide instruction and training in fishery and marine science techniques to personnel from countries interested in expanding and modernizing their fisheries. Although the Soviet Union is not a member of FAO, it cooperates in various FAO/UNDP projects.

Trainees from 9 Countries

Fifteen trainees from Algeria, Ethiopia, Indonesia, Philippines, Romania, Syria, Sudan, Tunisia, and Turkey participated in the study cruise. Their work was guided by Soviet and FAO scientists and technicians, who conducted lectures and practical demonstrations in marine biology and oceanography.

Following the cruise, which began in Tunis and ended in Naples, trainees and Soviet officials visited FAO headquarters in Rome. ('Fishing News International,' Jan. 1969.)

FAO Says World Will Need 100 Million Tons of Fish by 1985

The world's need for fish is expected to rise from about 60 million tons to 100 million tons by 1985, FAO says.

The estimated increase is part of a study of future world food needs by the Indicative World Plan for Agricultural Development being prepared by FAO. The study's fishery aspects were discussed in April 1969 by the FAO Committee on Fisheries at FAO headquarters in Rome.

Projects World Demand

The study findings are not final. The study starts from a 1962 base and assumes a predictable rate of increase in demand. It projects world demand for fish and fishery products at 70 million tons in 1975--and about 100 million tons in 1985. About one-third of this demand would be for fishmeal for feeding animals.

At the same time, the estimated potential of species fished now in marine and inland waters was estimated at 140 million tons. This excludes krill, lantern fish, and other small fishes that people do not eat; if these species were included, the potential harvest would be raised to 200 million tons or more.

The greatest proportionate increase in demand is expected from the developing countries. However, the greatest increase in fishing effort seems likely to be made by developed countries, such as Spain, the Republic of South Africa, and the Soviet Union.

Uneven World Fishery Output

The study notes that world fishery production has been increasing at a faster rate than population growth. But it has been an uneven increase--in species caught and geographical distribution. "Much of the rise was not used for human food."

Members of the 34-nation committee agreed that the increased demand, especially for species now fished, called for international surveys and measures to manage fish stocks. The committee recommended further study after delegates emphasized the need for more precise estimates of consumption and demand.

Dr. William M. Chapman of the U.S. predicted that technological advances and expanded world trade in fishery products would push production and demand even higher than the FAO study forecasts.

FAO Official Warns of Dumping Chemical Wastes into Sea

Marine pollution is being aggravated by new forms of contamination. One is the long-discharge pipe used to dump chemical wastes into the sea, says Dr. Sidney I. Holt of FAO's Department of Fisheries. There is an "increasing tendency to deliberately discharge wastes at considerable distances from shore through pipes extending into the sea instead of using ships for the purpose."

Dr. Holt adds that some pipelines extend many miles from shore and carry industrial and municipal wastes harmful to fish and other marine life. There are no international regulations to register or control this dumping. However, Dr. Holt points out, most dumping is done from ships. He notes the growing danger of accidental pollution from bulk transport of toxic substances.

FAO Committee Meets

Dr. Holt spoke recently before the 34-nation FAO Committee on Fisheries during debate on marine pollution problems and the international action necessary to prevent future 'Torrey Canyon' disasters.

Poland and Finland reported to the Committee that pollution in the Baltic Sea continues to worsen because of industrial wastes and the shallowness of coastal waters. The Baltic's pollution is the subject of an international study expected to be published in October 1969 by the International Council for Exploration of the Sea.

Spain complained about the continued dumping of radioactive wastes in the Iberian trench 200 miles off Spain and Portugal.

Nigeria warned of the effect on fisheries of shock waves from underwater detonations in oil explorations on continental shelves.

Tanzania expressed fear of pollution from oil tankers too large to navigate the Suez Canal. At present, she has no coastal pollution problem.

Other African countries expressed concern that industrialization might make their continent the newest area of marine pollution.

The United Kingdom noted that new forms of pollution occur all the time, including run-off of pesticides from the land.

Dr. Holt concluded that the variety of pollutants is "increasing almost faster than our ability to get information on them."

In late 1970, FAO will hold an International Conference on Marine Pollution and its Effects on Fisheries.

Peru Offers Aid to Developing Countries

A leading Peruvian fishery industrialist has promised that Peru, the world's largest producer of fish meal, will assist Asian and African developing countries to establish fish-meal industries.

L. Banchero Rossi, president of Peru's National Association of Fisheries, told an FAO subcommittee that Peru would be "delighted" to offer its experience in fish-meal production to countries bordering the Indian Ocean.

Indian Ocean Resources

Banchero spoke during a debate on proposals to promote development of the vast resources of the Indian Ocean. The possibility of increasing its yearly fish catch from about 2.2 million metric tons a year--about 1/20th the world marine catch--is being studied by the FAO Indian Ocean Fishery Commission.

Banchero said that his country could train personnel from Asia and Africa in fish meal factories in Peru. Efforts would be coordinated through FAO. ('Fishing News International,' Mar.)

FOREIGN

CANADA

PROPOSALS TO ASSIST FISHING INDUSTRY

Canadian Fisheries Minister Jack Davis said in House of Commons, Feb. 20, 1969, that the groundfish industry is in trouble because export prices for frozen groundfish products have declined sharply since 1967. He noted that the industry sells close to 90% of its output in the U.S., and that the Canadian government must reinforce the industry's position abroad to improve the marketing outlook permanently. The proposed assistance to the Canadian commercial fisheries consists of:

1. Government purchase of frozen groundfish products to strengthen and stabilize the market. Accumulated supplies eventually will be sold through ordinary commercial channels, but not at prices lower than those paid for them. Nor will they be sold until the export price is high enough to cover basic costs of production, including an adequate price to fishermen. Close to 15,000 fishermen, plant workers, and their families depend on the groundfish fishery. The government hopes to hold fishermen's prices at a level no lower than the 1965-67 average.

2. Emergency loans to fishing and processing firms in 1969 for working capital and industry restructuring. Repayment will be waived until the market price of principal groundfish products reaches a level that will ensure adequate returns.

3. Mid-term and long-term measures are also contemplated because important economies may be achieved soon both at sea and in processing plants. The groundfish industry will be encouraged to get financial assistance under the Canadian General Adjustment Assistance Program. Under this program, assistance is available to any firms prepared to restructure operations to improve its competitive position, between now and the early 1970's.

* * *

FAVORABLE REACTION TO GROUNDFISH PURCHASE PLAN

General industry reaction to the proposed new groundfish purchase plan is favorable, although Nova Scotia fish producers are not sure whether it includes all groundfish, or just some of more beleaguered species such as cod. No additional details have been announced since the plan was proposed in the House of Commons on Feb. 20. It is believed, however, that the overall cost would be more than the C$4 million deficiency payments of last year.

Adequate storage space exists for any government purchases that may be made. There is some risk that the government eventually might be forced to dispose of some purchases for fish meal or other low-return products, thereby taking a loss.

Program's Goal

The goal of the program is to make sure exvessel prices do not fall below 1965-67 levels. Canadian newspapers speculate that the government will pay a few cents above the current average production price of 26 cents a lb. for cod--6-7 cents a lb. more than the industry now gets on the U.S. market. Larger producers are particularly pleased with the new program because they own the warehouses in which government-purchased fish must be stored. (U.S. Consul, Halifax, Feb. 26, 1969; U.S. Consul, St. John's, Mar. 3, 1969.)

* * *

INTERNATIONAL COOPERATION ON GROUNDFISH MARKETING

A major Canadian move to assist the deflated world markets for groundfish has brought promises of cooperation from Denmark, Iceland, and Norway.

Canadian Fisheries Minister Jack Davis said: "I am delighted to hear that the Nordic countries, who are our chief competition in the groundfish field, have endorsed our programme of price stability for the frozen

Canada (Contd.):

groundfish industry. The programme, instigated here, puts the Government, through its Fisheries Support legislation in the Canadian market itself and was designed to raise fish prices by holding back supplies until the market adjusted itself upward.

The participating nations agreed to watch the trends on world markets under review and to meet again later this year. (Canadian Fisheries Ministry, Mar. 5,1969.)

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DOGFISH CANNED SUCCESSFULLY

A Canadian has claimed success in canning dogfish. He reports it tastes like black cod. Dogfish had defied canning before because of its high ammonia content.

Armand St. Jean of Nanaimo, who worked on this project for 3 years, intends to open a C$200,000 complex employing 50 people to can and market the product. ('Canadian Fisherman,' Mar. 1969.)

* * *

STRENGTHENS LOBSTER LICENSING PROGRAM

Four new regulations have been added to the lobster licensing program for the waters off Nova Scotia, New Brunswick, and Prince Edward Island:

(1) Minimum trap limits are being established to define the lower limit of commercial fishing operations in all lobster districts; (2) Fishing for lobsters on Sunday will be prohibited in all districts after April 10, 1969; (3) Provision allowing jointly owned and operated lobster boats to fish additional traps have been terminated. However, boats that were in this category last year will retain this privilege, subject to certain qualifications; (4) Future changes in ownership of licensed boats must be registered promptly with the Department of Fisheries.

Measures to Improve Incomes

The new regulations are a sequel to the measures to improve fishermen's incomes announced Jan. 20. These placed an upper limit on the number of boats allowed to fish in the Maritimes in 1969 and thereafter. (Canadian Dept. of Fisheries, Feb. 27, 1969.)

* * *

MARITIME PROVINCES LANDINGS INCREASE

The January 1969 catch of the Maritime Provinces--Nova Scotia, New Brunswick, Prince Edward Island--indicated their fisheries were off to a very good start.

Maritime Fish Landings, Jan. 1969 and 1968

	Jan. 1969	Jan. 1968
Landings (million lbs.)	32,919	17,945
Total value (million C$)	2,319	1,133
Price per pound (C$) (paid vessel by first buyer)	0.0704	0.0631

Landings, total value, and price per pound were well above Jan. 1968. The improved catch was attributed to unusually good weather. Only haddock, halibut, and scallop landings were below normal. (U.S. Consul, Halifax, Feb. 25, 1969.)

* * *

SEMIFACTORY TRAWLER FOR FROZEN HERRING PRODUCTION TO BE BUILT

The Nova Scotia Fishermen's Loan Board has granted a loan for construction of a steel midwater trawler. Described as a semifactory vessel, it will be the first of its kind in Canada.

The vessel, capable of staying at sea for 15 days, will carry a crew of 22. It will be 155 ft. long overall, is designed to displace 950 long tons, and will have a 13.5 knot cruising speed. It will fish food herring.

Packed & Frozen Aboard

Herring will be graded, packed, frozen on deck, and stored in a fish hold at -20° F. When removed from the vessel the fish will be placed in refrigerated containers.

The owners have contracted to supply Industrial Importers of Hamburg, Germany, 10,000 metric tons of frozen herring a year. ('Canadian Fisherman,' Mar. 1969.)

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Canada (Contd.):

FISHERIES MINISTER DISCUSSES INTERNATIONAL FISHERY ISSUES

Speaking to the United Fishermen and Allied Workers' Union in Vancouver on Feb. 1, 1969, Canadian Fisheries Minister Jack Davis presented his ideas on several major international fishery problems.

He said: "Only by managing our fish resources in a more effective way will be able to enjoy a higher standard of living all around. We need to cooperate with other nations in the best possible management of all of the fish resources available to mankind. Each species should be assessed, managed and fished with an eye both to maximizing our future food supplies and producing the best possible return to the fishermen themselves. Canada. . .must press for another Conference on the Law of the Sea. This must come and come soon.

"I would like to see Canada press, not only for better conservation, but also for the best possible management of fish resources everywhere. I would like to see the nations of the world agree on the establishment of broader and more realistic fishing limits. By broader and more realistic fishing limits I mean whole fishing zones which describe those great areas of the sea in which most of our commercial species live out their natural lives. I mean the Continental Shelf in the case of bottomfish. I mean natural boundaries, such as the boundaries of the Continental Shelf, as opposed to artificial lines negotiated and drawn by politicians who have little or no understanding of the life cycle of the fish themselves.

"I believe that the United Nations should actually be responsible for the development of all our fisheries on the 'high seas.' International treaties will no doubt continue to be a useful device. But the United Nations is a better forum in which to develop many of these international understandings. Fishermen would, of course, be active over great areas of the deeps. But their entry into this great international fishery would be restricted in various ways. It would be limited so that their total fishing effort would bear the proper relationship to the amount of the resource and by the need for the fishery to renew itself as the years went by.

"Each nation would be left to manage the resources living out over its own Continental Shelf. It would keep an inventory of the fish stocks within its own Shelf areas and it would follow their movements using the latest electronic devices which technology can provide.

"Of course each nation would license its own nationals to take many of these fish. But. . .each host nation would also license foreign fishermen to operate inside its own Shelf areas as well. These outsiders would, of course, have to pay a fee. They would have to pay a fee in order to help defray the host country's management costs. But if there are species of fish in which a country, like Canada for instance, has no immediate commercial interest--fish which may nevertheless be cropped without damaging the total resource--then why not let others take these fish in order to feed hungry people living in other and less fortunate lands?"

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1968 LANDINGS WERE 16% OVER 1967's

Statistically, 1968 was a good year for Canadian fishermen. Landings reached 2.8 million short tons, 16% over 1967. Landing value rose C$19 million to $169.6 million, 13% over 1967. Herring, salmon, ocean perch, and cod made up the bulk of the increased landings and higher total values.

Selected Species	Landings		Value	
	1968	1967	1968	1967
	. . (1,000 Lbs.). .		. . .(C$1,000) . . .	
Atlantic Coast:				
Cod	587,296	520,898	24,889	23,424
Haddock . . .	90,737	102,763	6,829	6,815
Pollock . . .	33,793	32,739	1,149	1,291
Flounder & sole	226,673	236,459	7,889	7,745
Herring . . .	1,152,467	757,293	12,287	8,140
Ocean perch .	201,871	173,078	5,250	4,475
Swordfish. . .	7,338	8,005	3,728	3,293
Lobsters . . .	37,322	34,920	24,515	23,254
Scallops . . .	15,648	14,711	13,399	8,138
Pacific Coast:				
Halibut . . .	28,319	26,222	7,080	6,631
Herring . . .	6,319	116,742	162	1,828
Salmon . . .	168,220	133,185	43,656	36,001
Cod	10,764	11,179	732	776
Total . . .	2,766,163	2,388,970	169,571	150,321

Source: 'Monthly Review of Canadian Fisheries Statistics,' Dec. 1968.

Despite the fact that landings, exvessel value, and market value of fishery products were generally high--reaching record levels in some cases--for much of the industry 1968

Canada (Contd.):

was a difficult year. Increased living costs and higher operating costs cut deeply into apparent gains.

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GOVERNMENT TIGHTENS CONTROLS ON FOREIGN FISHING VESSEL ENTRY

On March 18, 1969, the Canadian Department of Fisheries announced tightened controls on foreign fishing vessels in "Canadian territorial waters or fishing zones." The controls will take effect May 1, 1969, in the coastal waters and fishing zones around Nova Scotia, New Brunswick, and Prince Edward Island.

License Requirements

According to Department officials, the tightened controls are primarily aimed at better control over the increased number of foreign fishing vessels. The key element is the requirement of a license for each entrance of a foreign fishing vessel into permissible entry ports.

Little Effect on U.S. Vessels

The officials said the controls will not make much difference to U.S. fishing vessels. Since U.S. fishing vessels normally do not enter Maritime ports for supplies--but only for shelter, engine trouble, or to offload sick crew men--their requirements for the C$1 license are not expected to be large. Heretofore, only an annual entry license was rerequired. (U.S. Consulate, Halifax, Mar. 26.)

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C$4.2 MILLION ALLOTTED FOR LOANS TO GROUNDFISH PROCESSORS

Fisheries and Forestry Minister Jack Davis has announced that the Canadian Federal Government will make loans to companies processing frozen groundfish products. A fund of C$4.2 million has been set up for this purpose. The loan plan is designed to overcome the problems facing companies that are short on working capital and unable to obtain financing elsewhere. It is part of a general Government plan to aid both fishermen and processors.

Loan Conditions

Davis said the loans will be made at the government borrowing rate plus 2%. Principal need not be repayed for 5 years. Interest payments also may be deferred for 5 years. Half the money may be available to the borrowing company on April 1, 1969, or as soon thereafter as the loan is approved. The remainder may be drawn down in equal installments on July 1, 1969, and Oct. 1, 1969.

Davis emphasized that all loans are conditional upon the processor's agreement to pay fishermen prices for groundfish (cod, ocean perch, and small flatfish) equal to prices paid for similar quality fish in 1968.

* * *

BUILDS FIRST OYSTER HATCHERY

Canada's first oyster hatchery, at Freeland, Prince Edward Island, was scheduled to be ready this spring.

Oyster harvesting in the Maritime Provinces has dwindled to almost subsistence level due to environmental hazards and disease. However, scientists are firmly convinced that the industry can be rejuvenated through carefully controlled rearing methods. It is thought that, eventually, oyster farming could exceed the financial returns Canadian fishermen now get for lobsters.

Mobile Hatchery

The decision to build the C$9,600 oyster hatchery was based on the success of a mobile hatchery constructed by the Department of Fisheries. This large trailer will tour the maritime region to interest fishermen and others in the new process. ('Fishing News International,' Jan.)

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ST. PIERRE WILL HAVE NEW FISH WAREHOUSE

Albert Pen, St. Pierre-et-Miquelon's representative in the French Senate, has announced that construction of a huge refrigerated warehouse was scheduled to begin this

Canada (Contd.):

spring on one of the new wharves in St. Pierre Harbour. It will contain about 28,000 square feet of refrigerated fish storage space for Dutch, French, and West German fishing companies.

He said that the warehouse will permit European fishing vessels to land catches on the western side of the Atlantic and return to the fishing grounds, instead of returning to European ports each time a full load is taken.

Program to Attract Foreign Vessels

The refrigerated warehouse, expected to be ready by November, is another step in the continuing program of modernizing and expanding the facilities on the French islands to attract foreign fleets operating on the Grand Banks. Although some European fleets still visit St. John's on a more or less regular basis, St. Pierre facilities for servicing and provisions are attracting more and more foreign trawlers.

Other facilities built at St. Pierre within the past few years include modern ship-repair facilities and a large, new, artificially formed harbor. ('Canadian Fisherman,' Apr.)

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PRODUCTION STARTS AT NEW NEWFOUNDLAND PLANT

A new fish-meal factory was officially inaugurated on Oct. 24, at Isle aux Morts, on the southwest coast of Newfoundland. Isle aux Morts is very close to Port aux Basques, which has an excellent harbor and a year-round railway ferry connecting Newfoundland and Nova Scotia.

Built on the site of a former filleting factory, the new plant will be particularly important to Isle aux Morts. It will provide, among other things, an adequate supply of water to the islanders' homes.

The plant has 2 production lines, each with a 500-ton/24-hour capacity. There is also room to instal another 500-ton/24-hour production line.

Production Processes

The fish is pumped from the boats to the top of 2 steel storage tanks, dewatered, and weighed on an automatic belt scale. Each tank holds enough fish for 36 hours' production. Each is equipped with a system for circulation of blood water to prevent bridging of fish in the tanks. Screw conveyors transport the fish from the tanks to a feeding apparatus common to both lines. This apparatus automatically regulates the feed to 2 cookers. Discharge of raw material from the tanks is automatically controlled by level-regulating membrane switches installed on the feeding apparatus. Before entering the double-screw presses, the boiled fish passes through rotating prestrainers. The presscake then goes to disintegrators for further fluffing prior to drying.

Direct Fired Dryers

Two amply dimensioned direct-fired dryers are arranged so both production lines can be operated in series, with either dryer as pre-dryer. The dryers also can be operated in parallel and supplied by either press. Both are equipped with return-screw conveyor for meal recirculation.

The dryers have automatic temperature controls and automatic fire alarms and fire extinguishers.

Treatment

The meal is carried to the meal storage from the dryers by screw conveyors. Before grinding and bagging, it passes a magnet-removing tramp iron. The meal bags are flattened between rollers for easier stacking. All meal is treated with antioxidants immediately after leaving the dryers.

Sludge & Stickwater Used

Sludge and particles of dry matter are removed from the press-liquid by 3 cylindrical vibrating sieves and returned directly to the presses. The sludge is returned to the production together with the stickwater concentrate. (An automatic triple-effect stickwater evaporating plant has been included.) The factory manufactures only whole meal; the stickwater concentrate is added to the presscake immediately after the presses.

Oil Separation

Oil is recovered from the press-liquid by 3 automatically controlled separators. The oil is pumped to large settling tanks, purified, and pumped to storage tanks. ('Canadian Fisherman,' Apr.)

EUROPE

Norway

WINTER HERRING FISHERY CALLED WORST IN CENTURY

After almost total failure in 1967, Norwegians had hoped the winter herring fishery would come back in 1968. But this winter's catches, through mid-March, were even worse than the year before. Fishing began during the third week of February as small schools approached the coast. Full migration was expected the first week of March, but bad weather curtailed fishing. Only a few fishing days have been possible since and results have been called "miserable." About 150 purse seiners participated.

"Storsild" and "Vårsild"

After this poor start with the early "storsild" fishery, Norwegians hoped the following "vårsild" season would bring catches up to a more respectable level. The ripe, prespawning winter herring arriving at the coast are called "storsild" (large herring). The spawning and spawned-out fish are "vårsild" (spring herring). Because of quality differences that affect the market value, there is a "cut-off day." Before that day, all herring caught are considered storsild, after that they are vårsild. The "cut-off day" this year was March 12.

Good Fishing in Faroese Waters

One bright spot was the excellent fishing reported in late March near the Faroe Islands. Much herring caught by Norwegian and Faroese boats in the area was very high quality and was sold for human consumption. Some was sold even by boats not equipped with refrigerated seawater tanks.

Capelin Fishery Excellent

The capelin fishery at North Norway also provided excellent results; catches up to mid-March were double those of the same period last year. A total of 370 purse seiners and trawlers were in the fishery off Finnmark and the Island of Senja. The latter ground is shallow and vessels with deep seines have experienced difficulties and suffered much gear damage. Heavy catches burst the nets of some vessels. (U.S. Embassy, Copenhagen, Mar. 28.)

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TO EVALUATE COASTAL SALMON FISHERY

In the wake of protests against the prohibition of drift gill net-fishing for salmon inside Norwegian base lines, the Department of Agriculture announced that scientific investigations of the salmon fisheries will be extended and intensified. The objective will be to evaluate the effect of the netting prohibition. A committee is being considered to conduct economic evaluations of this fishery and its regulation.

Agriculture Minister Defends Ban

The Minister of Agriculture has defended the prohibition. He said that several possibilities were considered to find a way of reducing the salmon harvest. It was decided that total prohibition of drift gill-netting inside a certain boundary would best provide the needed protection. He pointed out that if an international agreement to control the salmon fishery beyond the limits is desired, Norway must seek to limit the damage from drift gill-net fishing within its own jurisdiction.

Longlining Begins Earlier

The longline fishery beyond the limits off North Norway began much earlier this year than in previous years. The first vessel arrived on the grounds by mid-February. There are serious doubts in Norway about the quality of salmon caught so early. (U.S. Embassy, Copenhagen, Mar. 28.)

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PROHIBITS DRIFT GILL-NETTING FOR SALMON INSIDE BASELINES

Effective Feb. 7, 1969, Norway prohibited drift gill netting for salmon, inshore from Norwegian territorial sea baselines. This action was taken to reduce exploitation of salmon stocks. The Ministry of Agriculture, responsible for freshwater fishery resources including salmon runs, had pushed this prohibition.

Possible Extension of Ban

Extending the prohibition against drift gill-net fishing beyond baselines, either to

Norway (Contd.):

territorial limit or to 12-mile fisheries limit, will be considered during coming months. The prohibition inside baselines affects only Norwegian fishermen.

Fishermen Protest

Protests have developed in wake of the ban; the fishermen claim it will mean a catastrophic loss of income. The Fishermen's Association, declining to seek special exceptions for certain areas, will accept nothing less than complete withdrawal of the prohibition.

High-Seas Long-Line Fishery

Long-line fishing for salmon within the Norwegian fisheries limit has been forbidden for some time. Some officials would like to ban the long-line fishery beyond the Norwegian fisheries limit. This fishery, carried on in international waters by Danish and Swedish fishermen, could be prohibited only by international agreement.

Administration Change Sought

The Fisheries Director (Ministry of Fisheries) stated that the prohibition was effected by the Ministry of Agriculture before the Fisheries Directorate heard of it. Resulting controversy has evoked a demand that the administration of salmon and trout fisheries be removed from the Ministry of Agriculture, and placed under the Ministry of Fisheries. (U.S. Embassy, Copenhagen, Mar. 7.)

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ALL SEALING MADE SUBJECT TO CONCESSION

Sealing operations in all sealing grounds will be subject to Government concession, according to a Royal Decree of March 21. Sealing operations in the Northeast Atlantic have been subject to concession since 1965. The Ministry of Fisheries says a concession can be granted to anyone who conducted regular sealing operations for at least 3 years during 1964-68. Sealing must be carried out in the same vessel used in that period. The Ministry may grant dispensations from this rule, provided the applicant is known to be, or have been, connected with the sealing industry and possesses the necessary qualifications. The sealing must be justifiable in terms of a rational exploitation of the stocks. The Ministry also may stipulate tonnage, engine power, and vessel equipment.

After granting a concession, the Ministry may limit further particular sealing operations by stipulating maximum catch quotas.

Recommended by Biologists

The new regulatory measures were based on recommendations of marine biologists made several years ago. The Ministry has been considering the recommendations since then. (U.S. Embassy, Oslo, Mar. 28.)

* * *

EXPLORATORY VESSEL FINDS GOOD FISHING ON GEORGES BANK

The distant water longliner 'Pero', chartered by Norway's Institute for Marine Research for a 2-month exploratory cruise, found "very good" stocks of cod on Georges Bank. This happened after an initial period when catches were not impressive. One metric ton of fish, gutted weight, was taken on 2,000 hooks. She also found significant quantities of herring.

Cruise Results Reported

Frequent reports of the cruise results have been carried in the Norwegian trade paper 'Fiskaren.' The most recent report--"Possibilities for Norwegian Utilization of Herring Stocks on the American East Coast"--included a detailed account of the West German herring fishery on Georges Bank (published earlier in a German trade paper).

The report commented that the distance to Georges Bank is too great, even for vessels with refrigerated sea-water tanks, to return catches to Norway for processing. However, there should be good possibilities for vessels that can process herring on board, and for factoryships that can fillet herring for freezing, and produce meal and oil from the waste.

Exploration to Continue

During the second week of March, while 'Pero' was weatherbound near Nova Scotia, the crew reported shoals of herring all around the vessel. Fishing was to proceed farther west and north as soon as the weather improved. (U.S. Embassy, Copenhagen, Mar. 28.)

Denmark

CATCHES AND EXPORTS ROSE IN 1968

In 1968, Denmark's fishing fleet made record catches and her fishery exports reached new highs. Favorable weather throughout the year made a record number of fishing days possible. Prices generally were up from the 1967 low. Although exvessel prices averaged slightly lower for some species, a larger catch made up the difference. It provided higher overall earnings.

Catch

According to preliminary data, the 1968 catch was 1.4 million metric tons, more than 40% over 1967. This puts Denmark in third place--behind Norway and Spain--among Europe's leading fishing nations. Denmark will rank about 11th in the world.

Export Earnings

Fishery products exported from Denmark provided over US$133 million in exchange. Denmark ranks fifth among the world's leading fish exporting countries; she is surpassed only by Peru, Japan, Norway, and Canada.

Fishery products contributed about 5% of all Danish export earnings. About 8% (by value) is exported to the U.S., 40% to the Common Market, and 40% to EFTA countries.

Greenland Fisheries Unsatisfactory

Greenland fisheries were the one unsatisfactory area in 1968; cod catches were substantially smaller than in previous years. (U.S. Embassy, Feb. 20, 1969.)

United Kingdom

BLANKET OF PLASTIC BALLS SPEEDS GROWTH RATE OF YOUNG FISH

To sustain the high growth rate of young sole being reared experimentally in warmed sea water, some of the tanks will be blanketed with floating plastic balls during the coming winter. Careful measurements have shown that ball blankets minimize heat losses. These losses are particularly heavy at low air temperatures.

The experiments are being carried out by the British White Fish Authority at Hunterston, Scotland. The aim is to develop a fish-farming technique to a point where industry can take it up as a commercial proposition.

Shortens Growing Period

Experiments at Port Erin, in the Isle of Man, have shown that tens of thousands of eggs spawned by such fish as plaice and sole can be successfully hatched in captivity; only a small percentage survives in the open sea. The Hunterston work has shown that sole can reach market size in 2 years, instead of 4 required in the open sea. Ball blankets during the winter, and improved feeding methods, may reduce this growing period to 18 months.

Reduces Heat Loss

The insulating ball blanket technique, or Allplas system, is widely used in industry on heated open process tanks. Independent tests have shown that the system reduces open tank heat losses up to 70% and evaporation by nearly 90%. Within certain limits, the size of the ball has no bearing on the results. Therefore, it is a matter of choosing a size most appropriate for the application.

Keeps Growth Rate Steady

At Hunterston, a constant flow of sea water enters the fish tanks at between 61° F. and 64° F. Under adverse winter conditions, a ball blanket keeps the tank's temperature at 59° F. This is not only ideal for the growing fish, but 13° F. higher than the open sea in winter. The current experiments may prove that reducing heat losses from warmed water helps to maintain a steadier growth rate in winter.

Details of Allplas balls and their suppliers throughout the world are available from Allplas AG, Alpenstrasse 12, Zug, Switzerland. ('Canadian Fisherman,' Mar. 1969.)

* * *

BUILDS 'SEABED CRAWLER'

A seabed crawler designed to work on the Continental Shelf (as deep as 100 fathoms) is being built by a British shipyard and Britain's National Research Development Corp. It will cost about US$850,000. The government will provide 50% under long-term loan arrangements.

Launched from a mothership, the crawler will wind down to the seabed on a presunk weighted cable. Power will be supplied by

United Kingdom (Contd.):

cable from the surface. It will move on 4 large wheels powered by electric motors.

The Vehicle

The vehicle will have 2 compartments: one at normal pressure for the driver and an expert in the operation; another, open to the sea, from which divers can operate. The latter can also serve as a decompression chamber during and after return to the surface.

The vehicle will be fully equipped for communication with the surface and between command compartment and divers. It will also contain life-support systems and carry lighting and closed circuit TV. ('Canadian Fisherman,' Mar. 1969.)

West Germany

NEW FISH-WASHING MACHINE DEVELOPED

A new machine to wash a variety of fish has been developed by the German firm, Baader of Lubeck. The Baader 670 fish-washing machine is suitable for both gutted and whole fish. It is claimed that the extremely compact machine can be installed on board a vessel athwartship.

Operating Characteristics

The hexagonal drum-shell-type machine has an incorporated worm 6 inches high and turning rails. A centrally mounted water pipe washes the fish during its run through the machine. Dirty water, discharged through gill-shaped openings in the drum shell, runs to a water-collecting tray under the drum and drains off through an outlet pipe.

The drum, fitted between 2 synthetic spur rings, is supported by plastic rollers. Drive for the drum is provided by a combined spur and gear rim.

Size

The machine is 144 inches long, 47 inches wide, and 57 inches high. The 38-inch-diameter drum is about 118 inches long. ('Fishing News,' Mar. 14.)

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USSR

ARTIFICIAL CULTURE OF SEA STURGEON ATTEMPTED

In early April 1968, scientists of the All-Union Research Institute of Fisheries and Oceanography began an experiment in artificial culture of sea sturgeon, Acipenser sturio. Tests were performed in the area of Poti on the Black Sea. Three females were placed in a 5 x 7 x 1.2 meter enclosure at the mouth of the Rioni River. Despite stagnating water, salinity exceeding 15 parts per million, and water temperatures of 12 to 15.4° C. (54 to 59° F.), eggs were obtained, fertilized and incubated. Some hatched larvae were observed. The outlook for future large-scale sea sturgeon farming is promising.

Endangered Resource

The sea sturgeon, a valuable marine fish, was once native to the North Atlantic. It occurred along European coasts from North Cape to Black Sea, and along American coasts from Hudson Strait to South Carolina. The resource has been almost completely detroyed. Today, sea sturgeon spawns only in the Rioni River and is found only in the Black Sea.

Characteristics

Sea sturgeon reaches a length of 130-140 centimeters (cm) and a weight of 20-25 kilograms (kg) in 8 to 10 years. Specimens 2 meters long weighing 50 kg have been encountered. Russian sturgeon, Acipenser guldenstadti, is somewhat smaller and lighter at this age (100-110 cm and 10-12 kg). Male sea sturgeon are mature at 7 to 9 years, and females at 9 to 12--2 to 5 years earlier than the Russian sturgeon. Unlike other Acipenseridae, sea sturgeon can withstand high salinity and fairly low water temperatures. Its food is mainly anchovy and other small fish. It spawns a month earlier than Russian sturgeon, usually in the lower reaches of rivers, 80 to 120 km from the mouth. ('Rybnoe Khoziaistvo,' No. 12, 1968.)

* * *

70-80 PURSE SEINERS FISH MACKEREL IN NORTH SEA

The skipper of the Norwegian vessel 'Borgøygutt,' interviewed after his return from mackerel fishing in the North Sea, reported: "Norway has about 35 vessels fishing

USSR (Contd.):

on these North Sea grounds, but we are not the only ones there. At the Viking and Patch Banks, we saw a Soviet fleet surpassing the total fleets of all other countries. They have 70-80 power block-equipped fishing vessels supported by large motherships. I would estimate there were about 10 Soviet factory vessels ranging in size from about 3,000 to 20,000 deadweight tons." He saw only 2 Soviet gillnetters.

"The Soviet effort seems successful," the captain added. "Their purse seines fish deep and they have the most modern gear. When the purse seiners have a full load, the motherships come alongside and take the fish directly on board. This is a rational and fast method." ('Fiskåren,' Mar. 6.)

* * *

SEINERS FOR PACIFIC FLEET BEING BUILT IN SIBERIA

A new production line for oceangoing seiners has been set up at Sretenskii Shipyard, in the southeastern Siberian province of Chita. The hulls, reinforced to withstand ice pressure, will have up-to-date navigational equipment and communications systems. The gear issued will depend on the fishery in which the seiners are to be used.

More Comfort for the Crew

The fishermen will sleep in greater comfort: instead of the 6-man bunks provided in previously built seiners, the new type will have 2- and 4-berth cabins. (Various Soviet news agencies.)

North Pacific Deployment

The shipyard is on the River Shilka (see photo). The Shilka flows into the Amur River, dividing Mainland China from the USSR. As the Amur flows into the north Pacific, these seiners may be destined for north Pacific fisheries close to Soviet shores. This would explain the reinforced hulls.

Workers at Sretenskii Shipyard in southeastern Siberia build oceangoing seiner. (Photo: Tass)

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USSR (Contd.):

FISHERIES MINISTER REPLIES TO REPRIMAND

The reply of Fisheries Minister A. Ishkov to a reprimand from the Soviet Council of Ministers has been published by 'Vodnyi Transport,' official organ of the Merchant Marine Ministry and the Trade Union of Merchant Seamen. The Council had blamed 'weak leadership' of the Fisheries Ministry for inefficient use of the fishing fleet, failure to meet the growing demand for fishery products, and inefficient market promotion.

In his reply, Minister Ishkov stressed that the 1968 catch plan had been fulfilled 103%--6.7 million tons landed, 230,000 more than in 1967. He pointed to a 101% fulfillment of the 1968 sales plan. He noted that 68% of all fishery enterprises had switched to the new economic planning and stimulation system. Over 1 billion cans of fish had been packed. And, between 1966 and 1968, the fishing fleet had received 500 new vessels, including floating fish canneries, refrigerated fish carriers, and floating bases.

Notes Production Changes

Ishkov also reported production changes. Salted fishery products (except herring) dropped to 7% of total production from a recent 40%. Fresh-frozen production amounted to 60%. Production of fillets, sprats, sardines, and saury canned in oil increased. Production of canned fishery items amounted to 12% of total production of edible fishery products. He said that both quality and variety of edible fishery products have improved greatly over the past 3 years.

Announces Targets For 1969

He announced that targets for 1969 include increases in nearly all branches of the fishing industry: 7.4% in profits; 7% in sales; 10.4% in output of edible fishery products; 11.8% in canned fish; 14% in fillet production, and 35% in pond fisheries. The fleet is to receive 366 new large tonnage units.

Other targets are new fish-processing combines for Leningrad, Minsk, Volvograd, Alma Ata, and Donetsk; expansion of repair, docking and mooring facilities in all major fishing ports; and new rest homes for fishermen in Vladivostok, Nakhodka, Arkhangelsk, and Murmansk.

Stresses Switch to New Economic System

Ishkov said fish industry performance in the future will no longer be measured in terms of quantity of catch, but in ruble value of the output of edible fishery products. This change has been dictated by the need to meet growing demand for products of better quality. The fishing fleet has been directed to increase catches of higher-priced species.

Emphasis in the current year will be on continued conversion to, and development of, the new economic system. Results of the past 1½ years show greatly improved production efficiency, expanded personal initiative, and better use of basic capital. The fishing industry combines fishing, processing, packaging, ship repair, etc. So new planning and more effective stimulation methods must be developed to find better use for the rapidly growing fixed productive capital.

Criticizes Fishery Administrations

The Minister severely criticized several principal fishery administrations. He rapped the Far Eastern, Western, and Azov-Black Sea Administrations for not fulfilling 1968 catch quotas. He criticized poor fleet utilization. About 46% of the high-sea vessels (many belong to the administrations under fire) failed to fulfil the 1968 plan. He censured 'certain administrative executives' for tolerating systematic violations of vessel deployment schedules. He attacked the Far Eastern, Western, and Azov-Black Sea administration for 'brutally violating' fleet-repair schedules.

Ishkov also deplored the slow progress in mechanizing cumbersome fish catching and processing operations aboard vessels. This prevents effective crew cuts and operational cost reductions. He added that current educational and professional crew-training programs are inadequate. ('Vodnyi Transport,' Feb. 18.)

Council Reprimand

The Council's reprimand was a resolution titled 'Additional measures to improve the efficiency of the fishing fleet, better the quality, and expand the selection of fishery production.' It was adopted in late January 1969. (See CFR, April 1969, p. 54.)

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USSR (Contd.):

TO BUY IRANIAN CAVIAR

New prices for Iran's Caspian sturgeon and caviar exports to the USSR were set by the Iranian State Fisheries Organization and the Soviet Commercial Bureau on Mar. 15, 1969. All prices will be 25 to 30% higher than previous USSR-Iran trade contract prices. This will bring them to the level of world prices for these commodities.

The Agreement

Under the 3-year agreement, Iran will sell to the USSR 1,000 metric tons of sturgeon and 70 tons of caviar. The new prices will give Iran an additional 150 million rials a year.

The USSR also agreed to deliver a fleet of fishing vessels to Iran. The Soviets also will assist Iran in building inland hatcheries. ('Kayhan International,' Mar. 16.)

Poland

PROMOTES SALES OF HER FISHING VESSELS

Poland is actively promoting foreign sales of her fishing vessels. Here are 2 examples:

The CENTROMOR firm has commissioned Canadian naval architects of Montreal to undertake a design study for a fresh-fish stern trawler suitable for use off Canada's east coast. In the past, European-designed trawlers have not been found ideal for the rugged conditions off Canada.

Vessel Characteristics

The 172-ft., 2-deck stern trawler will be powered by a 1,600-hp. diesel with a service speed of about 13 knots. The engineroom will be forward, and a 315-ton capacity hold aft. A crew of 18 to 20 will be housed in single or 2-berth cabins. A model has been thoroughly tank-tested. Special care has been taken to insure stability under adverse weather conditions, particularly in ice.

Advanced Design

The trawl winch will be well forward of the bridge superstructure but beneath the deckhouse. This will allow safe working positions, and free almost the whole length of the deck for easier hauling. The advanced design may make the new vessel class equally suitable for some European fishing nations. ('Fishing News International,' Jan.)

Demonstrating Trawler in Ireland

In Ireland, CENTROMOR organized demonstration trips of a 96-ft. Polish TR27A-type stern trawler. The trips were made from Howth, Castletownbere, Killbegs, and Cork, in March 1969. Irish skippers were invited along.

The prototype of this series, 'Sola,' was introduced in 1968 as a replacement for the 78-ft. side trawlers used by the Polish fleet.

A basic unit in a number of models offered by the Gdynia Ship Repair Yard, Sola was designed by the Vessel Design Bureau of Gdansk. The Sola class vessels can carry a 9-man crew on trips of up to 20 days.

Layout

Sola's general layout is very practical. There is a central fishing control position at the afterside of the wheelhouse, which is set forward. Main engine and propeller remote controls are housed on the bridge. The 140 cu.m. capacity fish hold is insulated with styrofoam, lined with wood and hydronalium, and cooled down to a temperature of 0^{o} C. Fresh-water tanks have an 8.9 cu.m. capacity, and fuel oil tanks 55.9 cu.m.

Gear

Deck machinery is hydraulically powered from a main engine take-off. The trawl winch comprises 2 separate units. On the stern gantry above the slipway, 2 hydraulically powered warp blocks can be moved from the outer side of the gantry to the middle just above the slipway.

After the main trawl warps have been taken on the twin trawl winches, the doors are secured to the stern, and the cables clipped on to the auxiliary wires for hauling inboard. At this time, the blocks are moved to their inner position and the trawl wings are taken up the center slipway. When these are aboard, the cod ends are taken aboard by a gilson from an auxiliary drum. For shooting the procedure is reversed. ('Fishing News,' Mar. 14.)

Iceland

FISHING INDUSTRY DEVELOPMENTS

Record catches of capelin were made in March. The 1969 catch reached 100,000 tons; this compared with just over 78,000 tons for all of 1968, and a little over 97,000 in 1967. All storage facilities were full. Landings were running up to 10,000 tons a day. Capelin was being stacked in open areas to await reduction. Capelin meal prices were reported rising. Much of the meal was sold as soon as processed.

Capelin for human consumption is being tested by the Japanese, who had several technicians in Iceland last year. Iceland exported about 500 tons of frozen capelin to Japan in 1968 and has contracted to sell 750 tons in 1969.

White Fish

White fish catches had been somewhat lower than in 1968 due to strikes and poor weather. Catches in March were improving. However, the trawler catch was similar to last year's, and over 3,000 tons of iced fish had been sold in England and West Germany in January.

Marketing Developments

A sales contract, negotiated in February with Soviet trade representatives, provided for Icelandic sales of 21,000 metric tons of fishery products, including 13,000 tons of frozen fillets, during 1969.

The firm Einar Gudfinnsson of Bolungarvik has been experimenting recently with catching and processing scallops and other mollusks for the U.S. market. The quantity of available raw material reportedly is abundant. The quality of the product is good, but production and processing are still on a trial basis.

Technological Developments

On March 11, the West German shipbuilder, Uterwesen of Bremerhaven, contracted to build a US$2.4 million research vessel for the Icelandic Government. The 'Bjarni Saemundsson,' will be a stern trawler 49 meters long and 800 gross tons. She will be the first Icelandic ship powered by a diesel-electric system and be able to trawl at greater depths than any other Icelandic vessel.

Some Icelandic boats soon will be equipped with an improved purse seine, invented by Ingolfur Theodorsson of the Westman Islands. It has already been tested, with excellent results. The net purses faster than existing seines.

On-board tests of the Lowe-Temp seawater ice maker are about to start in Icelandic waters. It is produced by a company in Longwood, Florida. The ice maker already has been tested ashore by the laboratory of the Fisheries Research Institute. It is believed the new equipment (which produces ice flakes from undiluted sea water) may increase quality and value of catch of the groundfish boats through improved cooling. (U.S. Embassy, Reykjavik, Mar. 20.)

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LANDINGS AND UTILIZATION, 1967-68

	Year	
	1968	1967
	. . . (Metric Tons1/) . . .	
Landings by Species:		
Cod	234,653	204,403
Haddock	34,386	38,664
Saithe	38,032	29,036
Ling	8,896	7,724
Wolffish (catfish)	8,972	10,278
Cusk	4,873	2,722
Ocean perch	30,571	30,039
Halibut	1,054	1,040
Herring	142,820	461,533
Capelin	78,166	97,165
Shrimp	2,451	1,508
Other	14,423	12,484
Total	599,297	896,596
Utilization:		
Fish:		
Quick frozen	202,237	167,203
Stockfish (unsalted)	15,174	59,396
Canned	1,444	82
Smoked	21	19
Salted	115,178	70,454
Reduction	4,431	2,515
Herring:		
Salted	28,834	53,469
Frozen (bait)	9,024	15,735
Reduction	132,631	473,240
Home consumption (fish)	7,015	8,549
Crustaceans:		
Frozen	4,825	4,155
Canned	113	84
Home consumption	3	-
Fish landed abroad	78,367	41,625
Total	599,297	896,526

1/Whole ungutted fish.
Source: 'Hagtidindi,' Mar. 1969.

LATIN AMERICA

Mexico

1968 FISHERY PRODUCTION WAS ONLY 2.8% ABOVE 1967

Mexico's 1968 fishery production was 240,071 metric tons, only 2.8% more than 1967, according to preliminary data from the Secretary of Industry and Commerce. It had increased 12.8% from 1966 to 1967.

Fishery Production (Preliminary)

Species	1968	1967	1966
	(Metric Tons)		
Shrimp	36,061	42,719	39,743
Oysters	24,484	20,168	19,921
Sardines	27,889	29,634	18,761
Anchovy	15,883	22,755	13,748
Mackerel	7,056	5,973	5,247
Grouper	5,717	4,630	7,767
Abalone	3,404	2,691	2,778
Spiny lobster	1,337	1,571	1,386
Other	72,597	67,447	62,154
Total Edible	194,428	197,588	171,505
Kelp	28,229	20,141	22,212
Fish meal	11,433	10,163	9,602
Other	5,981	5,541	3,644
Total Industrial	45,643	35,845	35,458
Total Production	240,071	233,433	206,963

Shrimp landings, off 9.4% in volume for first-half 1968, continued to decline during second half; at year's end, these were 15.6% less than in 1967. Industrial products, led by kelp, moved ahead of 1967 by 27.3%. Fish meal production continued to climb slowly upward, increasing 12.5%.

Shrimp No. 4 Export in Value

Shrimp exports, mostly to the U.S., were worth 676 million pesos (US$54.08 million), down 15.6% from 1967. Still the most important fishery product in dollar value, the recent high market prices moved shrimp back to fourth place in value among all exports (after cotton, sugar, and corn). (U.S. Embassy, Mexico, Mar. 6.)

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THE FISHERIES OF CIUDAD DEL CARMEN

Ciudad del Carmen lies at the western end of Isla del Carmen, on Campeche Bay, at the southern end of the Gulf of Mexico. It depends almost entirely on shrimp for its economic stability. Unlike other Mexican Gulf ports, where finfish play important role, shrimp is king in Carmen. Finfish are handled only in some smaller plants catering to the domestic market.

Fish and Shrimp Production in Carmen

	Quantity	Value
	Metric Tons	US$1,000
1967	8,308	5,954
1966	8,059	6,656
1965	7,741	6,664
1964	8,446	6,990

Processing Plants

Ten shrimp-processing plants in Ciudad del Carmen process and pack shrimp for export--all to the U.S. Almost all of the exported product is peeled, deveined, and individually quick frozen (IQF), except for occasional small packs of larger sizes (10-14 and 15-20 shrimp per pound) in the green headless form.

Shipment to the U.S. is mostly by refrigerated truck, although some is shipped by refrigerated vessel. Combined production capacity of the 10 plants is 90,000 pounds a day of IQF (about 112,000 pounds of green headless shrimp). In order of size, the plants are: Productos Refrigerados, Isla Camaronera, Mariscos del Carmen, Congeladora del Carmen, Naviera Rex, Perla del Golfo, Booth Fisheries de Mexico, Congeladora Jomar, Congeladora Mexicana, and Fausto Cruz. Eight smaller plants process and pack shrimp and fish for domestic consumption.

Ice Production

There are 8 ice plants, each associated with a shrimp-processing plant. The combined daily capacity is 275 tons of block ice. Most of this goes to the shrimp vessel fleet for icing catches, but some is used in the plants. Several plants have flake-ice machines to supply in-plant needs.

Freezing-at-sea equipment has been introduced on a few vessels recently. A growing interest in this equipment has led to the local design and manufacture of an on-board freezer at a cost considerably below the better-known U.S.-built equipment. However, this locally built machinery is still quite new, and has to establish its reliability and trouble-free operation.

Mexico (Contd.):

Fleet Size & Maintenance

Carmen's shore plants are supplied by a fleet of 320 shrimp vessels of varying types, ages, horespower, and condition. All use modern double rig shrimp gear. Most plants have their own marine railways and repair yards to maintain and repair their own vessels and those supplying them. There is also a small shipyard presently building new shrimp boats, both wood and steel. (Regional Fisheries Attaché, U.S. Embassy, Mexico, Mar. 18.)

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NEW FISHERIES COUNCIL FORMED IN CAMPECHE

On Mar. 5, 1969, the newly formed Fisheries Council for the Campeche area launched an ambitious program to develop and improve the fishing industry. The Council is composed of representatives of the local trade association branch, the federal fisheries bureau, ice manufacturers, vessel owners, packers and processors, repair and maintenance services, fisheries unions and cooperatives, health department, and the State of Campeche.

Council Goals

The Council's objectives are: (a) improvement of the economic condition of the fishing industry and upgrading its products; (b) improvement of sanitary conditions on vessels, docks, and processing plants; (c) upgrading of training and competence of fishermen; and (d) increased knowledge of resources, particularly shrimp.

The Council plans to attain these objectives by pooling resources and efforts of the industry and government participants. As a first step, several Council members have drawn up proposed rules for sanitary practices aboard vessels and in processing plants. Mexico's fishing industry attaches great importance to the subject of improved sanitary practices.

May Spread to Pacific

The initial group in the Council represented interests in the Campeche area only. Later, neighboring fishing centers such as Ciudad del Carmen, Progreso, Veracruz, Alvarado, and Tampico will be invited to join in a comprehensive program covering the whole Gulf of Mexico coast. Mexico's Pacific Coast fishing industry, which provides about 70% of Mexico's annual production, may adopt some form of fisheries council in the future. (Reg. Fish. Attaché, U.S. Embassy, Mexico, Mar. 31.)

Peru

EXPORT TAXES ON FISH PRODUCTS REINSTATED

Certain export taxes on fishery products have been reestablished by Peru (Mar. 12, 1969). This was done because a 1967 law abolishing them had reduced the fiscal revenue required to finance the national budget, and had suppressed funds essential for national defense.

The new law virtually invalidates the benefits accorded by the 1967 law, No. 16694. Reestablishment of a 5% stamp tax on exports is considered a heavy burden to the industry. The provisions of the new law will be valid for 5 years, from April 1, 1968.

Reinstated Taxes

A 5% ad valorem stamp tax on exports of fish products (payable on the f.o.b. price) has been reinstated. A 5% stamp tax had been waived on both domestic transactions and exports of fish products by the 1967 law. The 1969 law exempts only domestic transactions.

Fish & Whale Oil

There will be a tax of US$5.16 a metric ton on crude fish and whale oil, and US$3.87 a metric ton on semirefined fish and whale oil. These export taxes on fish oil were originally imposed in 1965 and abolished in 1967. Refined or hydrogenized fish and whale oils are not subject to these export taxes.

Other Taxes

Other export taxes established in 1967 remain:

1% on f.o.b. Peruvian port price on fish and whale meal.

Peru (Contd.):

2% on f.o.b. Peruvian port price a metric ton on crude fish oil when export price does not exceed US$160 a metric ton; 4% when export price is higher.

1% on f.o.b. Peruvian port price a metric ton on semirefined fish oil when export price does not exceed US$170.00 a metric ton; 2% when price is higher.

All the above taxes, except the 5% stamp tax, are collected as advance payment of industrial and profit taxes. The 5% stamp tax is chargeable only to general expenses.

Suspension of 5% Tax

In response to intense industry opposition, the law reintroducing the 5% ad valorem tax on fishery products exports has been suspended for 2 months, effective Mar. 28. The suspension does not affect the other individual taxes on fish and whale oil. (U.S. Embassy, Lima, Mar. 27 & Apr. 11.)

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FISH MEAL PRODUCTION AND EXPORTS, JAN.-FEB. 1967-69

Production of Peruvian fish meal was low in February 1969 due to a short closed season that limited fishing to the southern part of Ilo. Exports remained high, however, due to good demand. (U.S. Embassy, Lima, Mar. 27.)

Fish Meal Production and Exports, Jan.-Feb. 1967-69

	1969	1968	1967
	(Metric Tons)		
Production:			
Jan.	240,495	284,021	287,466
Feb.	17,357	191,575	109,644
Total	257,852	425,596	397,110
Exports:			
Jan.	140,283	192,056	100,281
Feb.	185,938	188,222	115,673
Total	326,221	380,278	215,954
Stocks on hand Feb. 28	315,556	689,039	552,359

The 7 leading buyers, in first 2 months of 1969, were West Germany, 43,949 metric tons; Continental U.S., 43,748 tons; Netherlands 33,290; East Germany, 29,464; Spain, 26,843, and U.K., 20,456.

Chile

ANCHOVY CATCH, FISH MEAL & OIL PRODUCTION, 1966-68

Although far fewer plants operated in 1968 than in 1967, fish meal production increased 46%. During 1968, about 175,900 metric tons of fish meal and 28,000 tons of fish oil worth US$20,087,300 were exported. Most meal went to the U.S. and West Germany. The Netherlands took 90% of the oil.

Anchovy Catch, Fish Meal & Oil Production, Jan.-Dec. 1966-68[1/]

	1968	1967	1966
	(Metric Tons)		
Total landings of fish and shellfish at major ports	1,216,796	886,927	1,225,816
Anchovy catch:			
Dec.	61,500	61,300	18,000
Jan.-Dec.	963,300	708,600	1,072,300
Anchovy fish meal prod., major ports:			
January	31,403	16,343	33,547
February	24,669	20,608	27,318
March	7,665	8,703	14,054
April	2,024	1,651	14,786
May	5,729	3,765	27,013
June	30,069	16,948	19,031
July	29,428	14,279	18,046
August	36,638	6,304	18,014
September	6,103	11,730	12,819
October	1,049	12,933	3,235
November	7,214	8,206	2,137
December	12,111	11,502	3,664
Jan.-Dec.	194,102	132,972	193,664
Meal production from fish other than anchovy, south of Antofagasta:			
Dec.	1,870	2,450	2,700
Jan.-Dec.	42,600	33,000	27,000
Anchovy fish oil prod., major ports:			
Dec.	1,700	1,300	600
Jan.-Dec.	29,100	10,300	19,200
Oil production from fish other than anchovy, south of Antofagasta:			
Dec.	142	282	218
Jan.-Dec.	4,736	4,125	3,425

1/Some figures rounded.

Protein content of fish meal produced in December 1968 averaged 65%. The price varied between US$123-138 c. & f. (Instituto de Fomento Pesquero, Informe Mensual No. 12, Feb. 12.)

Cuba

FISHING INDUSTRY IS GROWING RAPIDLY

Cuba's rapidly expanding fishing industry may become one of Latin America's leading seafood exporters. But the industry is hampered by a lack of trained personnel. Some question whether disproportionate amount of investment has not been made for the returns.

New Markets

Despite this, the industry's outlook appears bright. Cubans themselves are developing a taste for more fish, a necessity because of chronic meat shortages. And a ready market exists in Western Europe for Cuba's spiny lobsters, shrimp, and other seafood. Most of Cuba's fishing exports go to France, Italy, Britain, and to socialist countries. Most of these exports represent new markets created by Cuba's need to pay for machinery and equipment.

Catch Increases

A new US$38 million fishing port near Havana was built by the Soviets in 1967. Since 1959, fishery production has almost quadrupled. Total catch in 1968 was an estimated 82,000 metric tons, compared with 22,000 in 1958. If present plans are realized, the 1968 record will be more than doubled to 200,000 tons by 1971. The forecast is based on an expansion program to increase substantially the tonnage of the fishing fleet, and its docking and storage facilities.

Shrimp Fleet Expands

Emphasis is given to increase the shrimp-fleet catch. Cuba recently acquired 90 steel-hulled shrimp trawlers almost exactly like those used by U.S. companies in Texas and Florida. Also, 12 shrimp vessels will be built in Cuba for 1969 delivery. Cuban shrimp vessels are intensifying operations off Venezuela, near mouth of Orinoco River, and off Surinam, Guayana, and French Guiana.

By 1970, Cuba expects to have 300 vessels and catch 10,000 metric tons of shrimp annually.

State-Run Industry

The industry is administered by the National Fishing Institute established in 1963 following a technical-assistance agreement with the Soviet Union. It is a sprawling agency that directs 3 fleets, fishing port of Havana, fishing cooperatives, warehouse and transportation units, a big shipbuilding facility, canning units, a scientific research center, and an export company. ('The Wall Street Journal,' Apr. 1.)

* * *

SPAIN BUILDS STERN TRAWLER

The super-trawler 'Mar Caribe' was being completed for Cuba at one of the Vigo (Spain) shipbuilding consortium yards in Jan. 1969. It will be one of Cuba's largest fishing vessels.

The 315-foot vessel, powered by a 4,000-hp. diesel engine, is equipped with a full Baader processing factory. She will carry a crew of 82 and have hold capacity for about 2,000 metric tons of frozen fish. The vessel was ordered originally by Spanish owners and launched as the 'Arcos.' ('Fishing News International,' Jan.)

The first of 5 more stern trawlers ordered from East Germany was delivered Jan. 19.

ASIA

Japan

REPORTS 1968 EXPORTS

In 1968, Japan exported 7.85 million cases (7-oz. 48's) of canned mackerel--2.51 million cases of natural pack and 5.34 million cases of tomato sauce and other packs. The sharp rise--55% from 1967 total of 5.07 million cases--was due primarily to increased purchases by the Philippines and South Vietnam. The former bought 1.3 million cases of natural pack and 2.7 million cases in tomato sauce and other packs; the latter 43,000 cases of natural pack and over 1.2 million cases in tomato sauce and other packs. Exports to the U.S. totaled 318,000 cases of natural pack and 7,000 cases in tomato sauce. ('Suisan Tsushin,' Feb. 12.)

Frozen Tuna Exports Steady

Frozen tuna exports were 107,084 metric tons valued at about US$41.1 million, compared to 107,132 tons and $45.4 million in 1967. Albacore tuna exports were down sharply--12,754 tons below 1967--but yellowfin and skipjack exports were up.

The 4 leading buyers were the U.S., 36,371 tons; Puerto Rico, 27,630; Italy, 24,954; and American Samoa, 5,757. ('Suisan Tsushin,' Feb. 10, 1969.)

Other Frozen Fish

Exports of swordfish, shrimp, saury, and squid increased, while oyster shipments declined sharply.

Exports of Other Selected Frozen Fish Products, 1968

	1968		1967	
	Quantity	Value	Quantity	Value
	Metric Tons	US$	Metric Tons	US$
Saury	14,367	4,382,661	12,953	4,294,000
Squid	12,526	4,188,492	11,825	3,108,958
Sea bream	9,494	1,466,472	9,607	1,526,036
Shark	4,935	3,032,511	4,379	2,260,489
Swordfish fillets	4,809	4,981,900	3,511	2,595,922
Swordfish steaks	2,226	2,900,386	1,811	1,732,178
Mackerel	3,044	573,167	3,268	595,236
Rainbow trout	2,563	2,315,600	2,406	2,425,033
Shrimp	2,312	5,309,330	1,286	2,497,211
Spearfish	711	384,325	785	394,578
Oyster	571	425,036	1,310	738,339
Salmon	18	26,856	24	38,050

Sharks previously were exported mostly to Italy but, since 1967, Holland and West Germany have become the major buyers. In 1968, Holland took 2,294 metric tons (1967--1,992), West Germany, 1,554 tons (1,515), and Italy 972 (700).

Frozen saury exports have increased steadily in recent years. In 1968, shipments to American Samoa totaled 3,099 tons (1967--3,275 tons), Mauritius 1,705 tons (1,245), Canary Islands, 1,205 tons (1,060), and Malaysia 1,184 (717). ('Suisan Tsushin,' Feb. 12.)

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REPORTS 1968 IMPORTS OF TUNA AND OTHER FISH

Frozen tuna imports in 1968 totaled 28,964 metric tons worth about US$10.7 million--79% higher in volume and 84% in value from 1967 imports of 16,184 tons worth $5.8 million.

Okinawa was the leading supplier with 9,692 tons (6,407 in 1967). Imports from Taiwan rose sharply from 2,061 tons in 1967 to 7,407 in 1968. Purchases from the Trust Territory of the Pacific Islands (Marshall, Marianas, and Caroline Islands) jumped from 278 tons in 1967 to 1,613 in 1968.

Other suppliers were: South Korea, 3,854 tons; New Hebrides Is., 1,592; American Samoa, 1,374; Malaysia, 1,139; Libya, 431; Panama, 377; U.S., 342; Fiji, 288; Italy, 253; Philippines, 253; and others, 349.

Imports of Other Selected Fishery Products (Not Canned)

Product	1968		1967	
	Quantity	Value	Quantity	Value
	Metric Tons	US$	Metric Tons	US$
Spanish mackerel	8,605	3,762,728	9,417	4,043,400
Squid	8,503	2,584,561	5,166	1,563,167
Salmon roe	5,016	14,989,728	2,765	7,503,850
Herring	4,277	716,661	3,372	552,433
Croaker	3,392	744,728	5,013	1,085,847
Hairtail	2,308	450,133	4,605	887,428
Salmon & trout	2,232	2,022,961	1,483	1,164,839
Yellowtail	1,382	754,364	469	356,689
Sea bream	1,146	367,544	1,556	516,067

Other Fish

Data on other fish imports (not canned) show salmon roe increasing sharply. These

Japan (Contd.):

rose from 2,765 metric tons in 1967 to 5,016 tons in 1968, reaching the 5,000-ton level for the first time. The U.S. supplied 3,663 tons (1967--1,888 tons) and Canada 1,343 tons (872).

Salmon and trout also were about 800 tons over 1967 imports. Leading suppliers were the U.S. with 1,293 tons (1967--1,019 tons), USSR, 485 tons (100 tons), Communist China, 303 (277), and Canada 170 (10). ('Suisan Tsushin,' Feb. 6 & 7.)

* * *

1969 TUNA FISHERY STARTS SLOWLY

In Jan.-Mar. 1969, the 4 Japanese purse seiners in the eastern Pacific yellowfin tuna fishery did not fare well because of unfamiliarity with local fishing conditions. However, recent reports indicate they finally found some good grounds off Mexico.

Indian Ocean

In the western Indian Ocean, the good yellowfin run that developed in early 1967 and 1968 was absent this year. Fishing was generally poor, except near the Arabian Sea where some vessels were making good catches. Several dozen Taiwanese long liners in the western Indian Ocean also experienced poor fishing.

Atlantic Fishing

In the Atlantic, fishing was also generally slow except in the Gulf of Guinea. There, yellowfin fishing began picking up. Some vessels were taking 3-4 tons per operation. In the central equatorial Atlantic, 14 Japanese long liners based at Sao Vicente, Cape Verde Island, were averaging 3 tons per operation (80% albacore). The Mar. 1969 price for Atlantic-caught albacore transshipments from Sao Vicente to Puerto Rico was quoted at f.o.b. US$421 a short ton. ('Suisan Tsushin,' Mar. 22.)

* * *

TUNA FISHERY REGULATION URGED

Scientists at the tuna research meeting in Tokyo, March 11, 1969, warned that continued tuna fishing at or above the present level would deplete western Pacific stocks. Noting the fate of whale resources, they urged adoption of a workable catch regulation for tuna. The meeting was sponsored by the Japan Fishery Resource Conservation Assoc.

The scientists were Drs. Hayashi and Suda of the Far Seas Fisheries Research Laboratory, Fisheries Agency. They reported that the recent sharp decline in hook rate in the southern bluefin fishery had caused vessels to shift to other grounds worked by S. Koreans and Taiwanese. This will increase fishing pressure and deplete resources. The scientists said that resource management must include tuna species other than southern bluefins.

Threaten Other Tunas

Dr. Hayashi said the vessels shifting to new grounds may concentrate next on other tunas, such as big-eyed, and deplete the resources. He urged that fishing be reduced to half the 1966 effort, when 90 million hooks were used, to restore the resources.

During the past few years, Dr. Suda stated, it had been wise to hold the tuna fleet at the 1963-64 size. In the earlier period, the fleets were divided between those fishing for export trade and those supplying domestic market. This achieved a balance of harvest. When "immense interest" in southern bluefins developed, effort concentrated on certain species. One species was overfished, then another.

"It is becoming increasingly necessary to regulate the tuna resources," he emphasized.

Management Proposals

Dr. Suda proposed 2 important steps to manage the resources:

1) Establish restrictions on area, fishing season, vessel operations, and a catch quota by species and area.

2) Japan should persuade S. Korea and Taiwan to discuss resource management. Japanese efforts alone have been "relatively weak."

Although Japan has stopped increasing her tuna fleets, other nations have increased their fishing capacities to around 100,000 tons. Competition of Japanese with these fleets in the new areas will deplete the resources. ('Suisan Keizai Shimbun,' Mar. 14.)

* * *

Japan (Contd.):

PRICES RISE ON
FROZEN TUNA EXPORTS TO U.S.

Because U.S. fishermen were making good yellowfin tuna catches in the eastern Pacific in early April, major U.S. west coast packers were not importing yellowfin. However, some smaller packers continued buying actively from Japan. Prices for frozen, gilled-and-gutted yellowfin were c.i.f. US$427.50 a short ton, a slight increase over earlier prices. Frozen round albacore rose to c.i.f. $530 a short ton, somewhat above the $515-520 in 1968.

Albacore in Demand

Export demand for albacore in early April continued brisk owing to strong buying interest by major U.S. packers. But practically all Japanese trading firms are out of supplies. According to some firms, albacore prices are continually rising because of supply scarcity and may remain high even after the summer albacore fishery begins. Because domestic packers are eagerly waiting to buy the summer catch, it may be difficult to obtain export supplies.

Puerto Rican Deliveries

In the Indian and Atlantic oceans, albacore are said to be small and not suitable for packing. Those taken off Angola, where fishing was gradually picking up, were 20-40 pound size. Grade A fish were bringing c.i.f. $440 a ton and grade B $390 a ton, delivery Puerto Rico. ('Katsuo-maguro Tsushin,' Apr. 4.)

* * *

FROZEN TUNA EXPORT TARGETS
SET FOR BUSINESS YEAR 1969

The Japan Frozen Foods Exporters Assoc. has adopted frozen tuna and frozen swordfish export targets for business year (BY) 1969 (Apr. 1, 1969 to Mar. 30, 1970).

Canada & U.S.

The target for frozen tuna exports to the U.S. and Canada is 75,000 short tons, 25,000 tons less than the 100,000 tons in 1968. The goal for frozen tuna loins and discs exports to Canada and the U.S. is 4,500 tons. The 1969 frozen swordfish export quota for the U.S. and Canada is 5,500 short tons.

Overseas Bases

The export targets for overseas bases, reduced 50% from 1968, are (in metric tons): American Samoa, 12,500 tons; Espiritu Santo, New Hebrides Island, 3,000 tons; Fiji Island, 4,500 tons; Penang, Malaysia, 3,000 tons; Saint Martin Island, West Indies, 1,000 tons.

For other areas, the export goal for the new business year is 35,000 metric tons. ('Katsuo-maguro Tsushin,' Mar. 20.)

* * *

CANNED TUNA IN BRINE STOCKS DROP,
PRICES RISE

The Tokyo Canned Tuna Sales Co. had about 750,000 cases of export canned tuna in brine in stock at the end of 1968. Practically all of it was sold by late March 1969. This left the company virtually no stock for the new business year (BY) beginning April 1. This occurred because of the buying rush by trading firms. The firms, assessing the recent low canned tuna output by domestic packers and the production outlook, felt they would face supply shortage unless they stocked up immediately. This was especially true because some major trading firms had been buying all can sizes, particularly the 4-lb. cans (6 to case), since around mid-Feb. Consignment of production to the Sales Co. by domestic packers has fallen far below expectations this year. The trading firms do not foresee any large increase in output before the summer albacore fishery starts in early May.

BY 1969 Canned Tuna in Brine Export Prices[1/]

Case & Can Size	White Meat, Solid		Light Meat, Solid	
	Old Price	New Price	Old Price	New Price
	(US$/Case)			
7-oz. 48's	11.01	11.11	8.40	8.49
13-oz. 24's	10.18	10.33	7.72	7.86
66½-oz. 6's	11.58	12.06	8.97	9.30
3½-oz. 48's	6.56	6.66	-	5.11
6½-oz. 48's	8.01	8.11	-	6.13
6.6-lb. 6's	19.94	20.67	-	15.98
6.6-lb. 6's Chunk	-	18.49	-	14.29

1/Ex-warehouse, Shimizu, Japan.

Export Prices Rise

The company announced a slight increase in export prices on April 1. The price revision was made because of the company's stock situation and the U.S. tariff cut of 1% (effective

Japan (Contd.):

Jan. 1, 1969) on canned tuna in brine imports in 1969. ('Suisan Tsushin,' Apr. 1.)

* * *

SEINERS FISH YELLOWFIN IN EASTERN PACIFIC

Four Japanese purse seiners entered the tropical eastern Pacific yellowfin tuna regulatory area in Feb. 1969, and began fishing in early March.

'Hakuryu Maru No. 55' (500 gross tons) and 'Gempuku Maru No. 82' (500 gross tons) fished off Ecuador. By early Mar. 1969, they had caught 50 tons and 10 tons of yellowfin, respectively.

'Hayabusa Maru No. 3' (275 gross tons) caught about 30 tons off Costa Rica. Her catch per day of operation--about 10 tons, more than twice the quantity normally taken by long line--is low compared to large U.S. seiners that catch as much as 30-40 tons a day. Her owners are hoping for a haul of at least 12-13 tons a day or 370-380 tons a month.

The 'Nissho Maru' (252 gross tons) was scheduled to start fishing in early March. All 4 vessels were searching for productive grounds in second week of March.

Performance Rating

It is too early to draw any definite conclusions concerning the performance of the seiners. However, some Japanese believe that their handicaps are already apparent--slower speed, 10 knots compared to 15-16 knots for U.S. seiners, and slower net-sinking speed compared to U.S. gear. ('Suisancho Nippo,' Mar. 11, and 'Katsuo-maguro Tsushin,' Mar. 7.)

* * *

EEL PRICES SET RECORD

A shortage of cultured eel has pushed prices at Tokyo wholesale market to a record US$1.28 a pound. This topped the earlier high of $1.26 in Osaka. Since January 1969, prices have risen almost 50 cents a pound. Eel processors, displeased over this trend toward a sellers' market, are considering suspending sales promotion.

Broiled eel is very popular in Japan. ('Minato Shimbun,' Apr. 1.)

* * *

1968/69 ANTARCTIC WHALING ENDS

The 3 Japanese whaling fleets participating in the 23rd Antarctic whaling expedition ended operations Mar. 22, 1969. All attained assigned targets. Japan was assigned a quota of 1,493 blue-whale units (BWU) for the 1968/69 season. ('Shin Suisan Shimbun Sokuho,' Mar. 26.)

Catch & Production	
	No. of Whales
Catch:	
Fin	1,821
Sei	3,495
BWU's	1,493
	Metric Tons
Production:	
Frozen	72,475
Whale oil	27,520
Salted	2,035
Solubles & others	3,257
Total	105,287

* * *

YAIZU LANDINGS DECLINED IN MARCH

Landings at the leading tuna port of Yaizu in March 1969 totaled 15,315 metric tons worth US$5.85 million, about 2,000 tons below the March 1968 landings of 17,002 tons worth $6.08 million. The decline was attributed primarily to the sharp dip in albacore tuna landings, down nearly 85% from comparable 1968 landings. ('Nihon Suisan Shimbun,' Apr. 11.)

	Quantity			Average Price		
	1969		1968	1969		1968
	Mar.	Feb.	Mar.	Mar.	Feb.	Mar.
	(Metric Ton)			(US$/Short Ton)		
Tuna:						
Bluefin[1/]	4,980	3,712	4,906	706	785	670
Albacore	225	251	1,521	479	492	358
Skipjack	3,962	2,946	4,717	267	284	214
Mackerel	5,347	3,018	5,288	73	115	93
Others	800	435	570			
Total	15,314	10,362	17,002			

1/Includes yellowfin and big-eyed tuna.

* * *

Japan (Contd.):

SUMMER ALBACORE TUNA FISHERY STARTS SLOWLY

The summer albacore tuna fishery is considerably later this year than in 1968. In early April last year, about 3,000 metric tons of pole-caught albacore had been landed at Yaizu. This year only a small quantity under-22-pound albacore had been landed by the same time.

Some Expect Improvement

The summer albacore forecast, published by Tokai University, indicates that the rather weak flow of warm waters off Bonin Islands (southeast of Tokyo) could be expected to delay formation of the main fishing school considerably. However, since the oceanographic conditions this year resemble those in 1965 (an excellent catch of 42,000 tons) and 1967 (fair catches of 28,000 tons), some observers expect a good summer albacore fishery. ('Suisancho Nippo,' Apr. 10.)

日本

Republic of Korea

COLD STORAGE COMPANY GETS INTERNATIONAL LOAN

The Asian Development Bank announced a US$7 million loan to the Korea Cold Storage Co. (KCSC) on March 13. The loan, guaranteed by the Government of the Republic of Korea (ROK), will be amortized over 15½ years, including a 4-year grace period; annual interest is 6.9%. Five Japanese commercial banks have agreed to participate in the loan--each with US$100,000. The loan will assist the development of fisheries, a high priority sector in Korea's development program.

Asian Development Bank Assistance

This is the first time specific financing has resulted from a technical assistance program undertaken by the Asian Development Bank. In March 1968, the Bank entered into a technical assistance agreement with the ROK Government and its Agriculture and Fisheries Development Corporation (AFDC) to help organize and develop AFDC activities. AFDC, established in Nov. 1967 as a government-owned statutory corporation, is charged with developing and promoting the storage and processing of agricultural and fishery products. Most of the technical assistance was completed in 1968, although 2 refrigeration and fishery experts are still serving in Korea under the agreement. The most important project proposed for Bank financing was the construction of processing facilities for fishery products intended for local markets. In July 1968, AFDC established a subsidiary--KCSC--to undertake this specific project.

Project Facilities

The loan to KCSC will finance foreign exchange costs of freezing, cold storage, ice-making, ice storage, and supplementary processing facilities in Seoul, Pusan, Mokpo, and Mukho; marketing facilities in Seoul, and transportation equipment. The total cost is estimated at US$18.2 million, including working capital funds of US$2.9 million.

Fisheries Problems

ROK's fisheries provide a livelihood for about 6% of her population, but low productivity of fishermen and inadequate distribution facilities hamper an increase in the living standard of fishermen. Efforts to expand fishery catches have been successful, but deficiencies in marketing and distribution have prevented full benefits from being realized. Prices of fishery products have been increasing faster than those of other foodstuffs, and fishery products continue to be too expensive for many Koreans.

Project Goals

KCSC will seek to eliminate bottlenecks in marketing and distribution by developing adequate freezing and cold-storage facilities and an efficient marketing system in Seoul. The facilities will enable the company to buy fishery products during peak periods and sell them off-season. This will eliminate price fluctuations due to seasonal changes of supply. Acquisition of refrigerated land transportation equipment and carrier vessels, also included in the project, will permit efficient operation and utilization of the planned facilities. (U.S. Embassy, Manila, Mar. 13.)

SOUTH PACIFIC

Australia

TUNA CATCH SETS RECORDS IN NEW SOUTH WALES

By Dec. 14, 1968, the New South Wales tuna catch was a record 4,358 short tons--311 tons above the entire 1967/68 season.

Fishermen used sea-surface temperature maps prepared by the CSIRO Division of Fisheries and Oceanography. CSIRO used a radiometer-equipped charter aircraft. Maps drawn in December showed a remarkable pattern of temperature fronts moving down the coast, providing ideal conditions for tuna schooling. Sixty live-bait pole boats and 37 trolling boats fished for tuna in southern New South Wales waters this season.

New Tagging Scheme

A new tuna tagging scheme was introduced. Fishermen marked selected fish as they were caught, then released them. Up to mid-December, more than 4,000 tuna had been tagged, and about 2,000, tagged in present and past seasons, had been recaptured. ('Australian Fisheries.' Jan.)

American Samoa

TUNA PRICES, MARCH AND APRIL 1969

Japanese tuna suppliers and U.S. packers in American Samoa agreed to maintain Feb. 1969 prices for March tuna deliveries. The Japanese had sought a $5-a-ton increase (later reduced to $2.50), but U.S. packers refused to grant any increase over Feb. prices.

March prices were, per short ton: round albacore: frozen $415, iced $400; gilled-and-gutted yellowfin: frozen $337.5, iced $317.5. ('Kanzume Nippo,' Mar. 14.)

Prices Up in April

In April, Japanese tuna suppliers and U.S. packers agreed on a $5-a-ton increase for albacore.

The new prices (per short ton) for round albacore are frozen US$420 and iced $405. Gilled-and-gutted yellowfin prices remain at March levels: $337.5 frozen and $317.5 iced. ('Suisan Tsushin,' Apr. 5.)

DO EAGLES SWIM?

On March 10, the biologists at BCF's Auke Bay (Alaska) Biological Laboratory had a ringside seat to the performance of an eagle diving upon a duck so swiftly that the eagle went into the water still holding the duck. The eagle swam to shore and hopped up on a rock, fluttered its wings and then sat there stoically while many of a flock of crows darted about it. After a short rest, the eagle flew across the bay with the duck still in its talons.

AFRICA

South Africa

CAN PILCHARDS FOR PET FOOD

Canned pilchards packed at Walvis Bay as a special brand of pet food will be featured as part of a special spring promotion in the U.S. Eight different brands of canned pet food will be displayed coast to coast by a U.S. company. A quarter of a million cases have been ordered from Walvis Bay this year. ('South African Shipping News and Fishing Industry Review,' Mar.)

South-West Africa

FISH MEAL SEASON IS UNDERWAY

The 1969 Walvis Bay pilchard season started during the first week of February when the first factories sent out fishing vessels. The other factories started in February or the first week of March.

Factoryships

The South African fish meal factoryships, 'Willem Barendsz' and 'Suiderkruis,' arrived off South-West Africa on Jan. 1, 1969, to start their 8-month season. Initial catches were reported poor, with a lot of anchovy present. But, north of Walvis Bay, catches had improved considerably by the third week of Jan.

Land-Based Plants

The 8 land-based pilchard plants--7 at Walvis Bay and one at Luderitz--are limited to a quota of 90,000 short tons each; a special research levy is placed on an additional 6,000 tons. However, as in 1968, the factories will divide the 96,000-ton quota of the new plant, Sarussas Ontwikkelingskorporasie, equally among them. Sarussas' additional quota can be used only after the company has established its factory around Rocky Point, well north of Walvis Bay.

Quotas

The 12,000 ton-per-plant anchovy quota was a concession for 1968 only; it is not known whether it will be extended to the current year. Last year, any anchovy caught in excess of 12,000 tons was deducted from the pilchard quota.

New Plant at Walvis Bay

The 96,000-ton quota granted to the whitefish consortium probably will be processed by the consortium plant now being built at Walvis Bay. It is expected to be operational by about midyear. ('South African Shipping Industry Review,' Feb.)

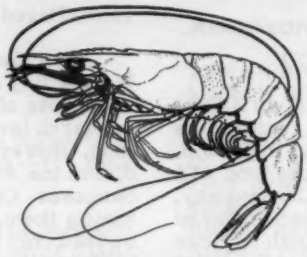
WHERE DO WAVES COME FROM?

The commonly seen waves on the surface are caused principally by wind. However, submarine earthquakes, volcanic eruptions, and tides also cause waves.

A breeze of less than 2 knots (2 nautical miles per hour) can form ripples. As the wind speed increases, larger more visible waves form. The wave height in feet usually will not be more than half the wind speed in miles per hour, although individual waves may be higher.

As long as the wind blows consistently from the same direction, the waves are referred to as sea. When the wind stops or changes direction, the waves that continue in a direction different from that of the local winds are called swell. ("Questions About The Oceans," U.S. Naval Oceanographic Office.)

FOOD FISH FACTS



NORTHERN SHRIMP
(Pandalus borealis)

The northern shrimp has traditionally supported a small, highly variable fishery in Maine and Massachusetts. The Gulf of Maine is considered the southern limit of these shrimp in the Northwestern Atlantic. Fishing for northern shrimp is a rapidly expanding industry growing from less than one million pounds caught annually prior to 1964 to over 13 million pounds in 1968. The fishing fleet, including many converted lobster boats, is growing at a comparable pace.

DESCRIPTION

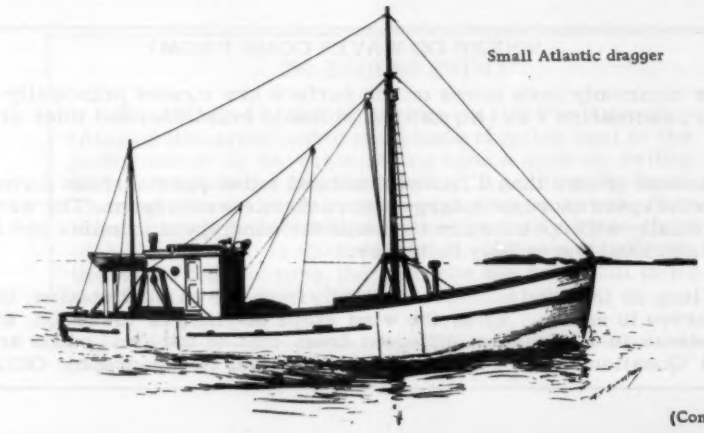
Northern shrimp are pink and are usually three to four inches in length. Some individuals may reach six inches. Their body shape resembles a small lobster or crayfish without pincers or claws.

HABITAT

On the Atlantic coast, northern shrimp are found on muddy or sandy bottoms in water from 150 to 900 feet deep. These shrimp are also found off the coasts of Alaska and British Columbia.

SHRIMP FISHING

Along the North Atlantic coast shrimp are caught from small vessels called otter trawlers or "draggers." The term "draggers" comes from the method of fishing. These boats drag a large flattened cone of nylon netting, called an otter trawl, along the ocean floor. As the net is dragged or towed along the bottom, shrimp are swept into the mouth of the net and concentrated into the bag or cod end.



Small Atlantic dragger

(Continued following page.)

MANAGEMENT AND CONSERVATION

Most northern shrimp are caught during the fall-to-spring months on fishing grounds within a 50-mile radius of Portland, Maine. Northern shrimp are the only species of commercial interest which are concentrated and available in this area during the winter. Because of this, the shrimp have attracted considerable fishing effort throughout the history of the fishery. The catch, however, of these northern delicacies has fluctuated greatly in the years prior to 1964. In 1964 the northern shrimp catch rose to over two million pounds, partly because fishermen began operating further offshore.

Interest in northern shrimp has increased greatly in recent years and, in 1967, BCF began an extensive systematic survey of these shrimp resources. Fishery scientists aboard the research vessel, 'Delaware,' operating out of the Bureau's Exploratory Fishing and Gear Research Base in Gloucester, Massachusetts, made four experimental cruises in the Gulf of Maine during 1967 and 1968. Cruises were made during different seasons of the year to determine if northern shrimp could be commercially harvested at times other than the fall-to-spring months.

Bureau scientists were also interested in: (1) whether shifts in shrimp population occurred from season to season (and, if so, to what extent); (2) boundary limits of these concentrations at different times of the year; (3) production potential of the shrimp population; (4) behavior and accessibility to fishing gear of northern shrimp populations; and (5) biological data, such as spawning seasons and size range, which might be important for commercial utilization of the resource. In addition, fishery equipment specialists tested and modified a new mechanical shrimp-fish separator. Fishery technologists, in search of new ways to get a better product to the consumer, also investigated several new methods of handling freshly-caught shrimp.

USES OF NORTHERN SHRIMP

Shrimp, the most popular of all shellfish, are an excellent source of high-quality protein, vitamins, and minerals. Shrimp are low in calories and fat and have a distinctive flavor. Northern shrimp may be used interchangeably with other varieties of shrimp in any recipe. Northern shrimp range from 40 to 50 per pound when caught. Headless shrimp run from 60 to 70 per pound; and peeled, headless shrimp range from 70 to 90 per pound.

These cold-water delicacies in raw, headless, frozen form are sold in 2- and 5-pound boxes. Peeled meats, which have been individually quick frozen, are sold in 9-, 10-, 16-, and 24-ounce poly-bags or rigid plastic containers. Block frozen, peeled meats in one pound, reusable, plastic containers were recently introduced to frozen seafood counters. (Source: National Marketing Services Office, Bureau of Commercial Fisheries, U.S. Dept. of Interior, 100 East Ohio, Room 526, Chicago, Ill. 60611.)

(Recipe on p. 60.)

MOVE OVER, MAINE CLAMBAKE!

Shrimp are No. 1 in popularity over all other fish and shellfish in the United States. This is not surprising because shrimp have a distinctive flavor and are so versatile they can be used in appetizers, canapes, dips, chowders, or many pleasing entrees that will satisfy the most delicate or the heartiest of appetites. There are several kinds of shrimp available in the United States. Among the more important ones are tiny, North Pacific shrimp, the Gulf variety, and northern shrimp found off the coasts of Maine and Massachusetts. BCF research vessels have recently located new resources in this area.

Shrimp are all lean meat, low in calories, and a complete, easily-digested protein food as well as being a fine source of needed minerals. They can be served plain or fancy and come in a wide variety of market styles. The tails of shrimp are the only edible portion, and these can be purchased either fresh or frozen, cooked in the shell, or cooked, peeled, and deveined--ready to use. Shrimp are also available in handy-dandy, shelf-ready, 4½- or 5-ounce cans, either packed in brine or dry. Breaded shrimp, ready to fry, can be found at frozen seafood counters.

Maine Shrimp in Wine Sauce, a new recipe from BCF, was created with the moderate-sized northern shrimp in mind; however, any shrimp may be used. This recipe features shrimp in a subtle sauce that is irresistibly delicious. Mushrooms and chopped onion are cooked and added to chicken bouillon, then sour cream and dry white wine are added with the shrimp just before serving. Serve it for hearty appetites over hot, fluffy rice, or show off a little and serve it with toast points or patty shells. Either way, this recipe is a year-round classic that can be served whenever you want the ultimate in good eating.

MAINE SHRIMP IN WINE SAUCE

- 1 pound cooked, peeled, and cleaned Maine shrimp, fresh or frozen
- ¾ cup chopped onion
- ¾ cup sliced mushrooms
- ¼ cup butter or margarine, melted
- 3 tablespoons flour
- 1 cup chicken bouillon
- ½ cup sour cream
- ¼ cup dry white wine
- Rice, toast points, or patty shells

Thaw frozen shrimp. Cook onion and mushrooms in butter until tender. Blend in flour. Add chicken bouillon gradually and cook until thick, stirring constantly. Add sour cream, wine, and shrimp. Heat, stirring occasionally. Serve over hot fluffy rice, toast points, or in patty shells. Makes 6 servings.

Three booklets, two in full-color, are available on shrimp and how to cook and use them. They are: "How To Cook Shrimp" (1 49.39:7)--20¢; "Can-Venient Ways With Shrimp" (1 49.49/2:2)--35¢; and "Shrimp Tips From New Orleans" (1 49.4:41)--25¢. Write to the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. (Source: National Marketing Services Office, Bureau of Commercial Fisheries, U.S. Department of the Interior, 100 East Ohio, Room 526, Chicago, Ill. 60611.)

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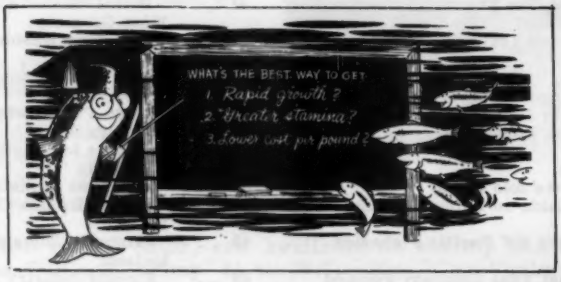

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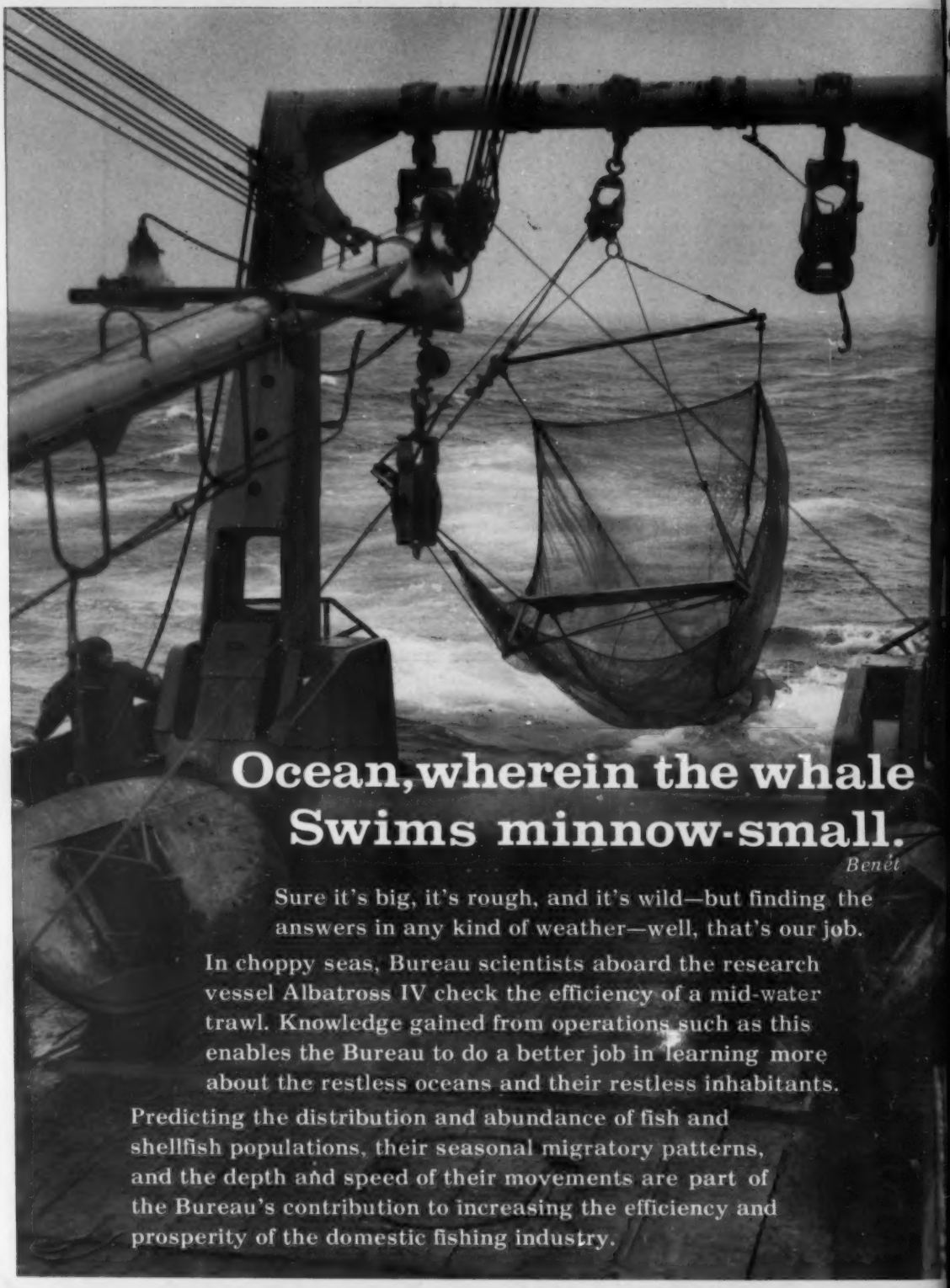
As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States -- now and in the future.

UNITED STATES DEPARTMENT OF THE INTERIOR

U.S. FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES



Ocean, wherein the whale Swims minnow-small.

Benét

Sure it's big, it's rough, and it's wild—but finding the answers in any kind of weather—well, that's our job.

In choppy seas, Bureau scientists aboard the research vessel Albatross IV check the efficiency of a mid-water trawl. Knowledge gained from operations such as this enables the Bureau to do a better job in learning more about the restless oceans and their restless inhabitants.

Predicting the distribution and abundance of fish and shellfish populations, their seasonal migratory patterns, and the depth and speed of their movements are part of the Bureau's contribution to increasing the efficiency and prosperity of the domestic fishing industry.